The Index Investor
Invest Wisely…Get an Impartial Second Opinion.

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April 2009 Issue: Key Points

In this month's letters section, we respond to a question about the performance of our model portfolios over the past five years. Are we satisfied with our portfolios performance over the past five years? If you include the impact of acting on our May 2007 (and subsequently repeated) recommendation to increase liquidity and decrease allocations to overvalued asset classes, the answer is yes. We got it right when many very smart people got it wrong, and cost their clients a lot of money and not a few hopes and dreams. Yet as we describe in this month's Product and Strategy Notes, we think there is still room for improving our methodologies, based on what we have learned from the past five years' experience. So in that sense, the answer is no. On balance, our model portfolios' basic asset allocations helped avoid the worst of the downside moves, and our rebalancing strategies and the warnings based on our asset class valuation and scenario analysis methodologies further reduced exposure to large downside losses. As a result, these model portfolios have an excellent chance of achieving their long-term targets, and thus the financial and life goals that are predicated on those returns. Given the challenges of the past few years, that is no

mean feat – but we're still striving to do even better in the future. This month's economic update provides an explicit overview of a technique we use, Analysis of Competing Hypotheses that focuses on searching for evidence which disconfirms, rather than confirms, different hypotheses. We review the new evidence that has accumulated over the past month against our Conflict and Cooperative scenarios, and conclude that recent developments suggest that the former is developing. Our first product and strategy note is quite long, and reviews in depth different quantitative aspects of real asset class returns over both the 2006-2008 and 1990-2005 periods. We conclude that a three regime model is the best approach to use in future asset allocation studies (including a normal regime characterized by rough equilibrium, and two disequilibrium regimes characterized by high uncertainty and high inflation). We also cover interesting issues related to bank stress tests, the performance of active managers, new ETFs that track hedge fund indexes, and research into whether the best managers really do move to hedge funds.

This Month's Letters to the Editor

In your February issue, you expressed disappointment with carbon emissions allowances as an asset class. With Obama embracing cap and trade, do you still feel that way?

Until we see the final shape of the U.S. system (which brings up the old saying, two things in life you are better off not seeing made are sausage and legislation), we are sticking with our currently negative view of carbon emissions as an asset class. As previously noted, the value of European carbon emission certificates has been closely correlated with real GDP growth – falling GDP led to falling production by the major emitters, which led to falling values for certificates granting the right to emit. As a result, the European Union is now moving to restrict companies ability to use so-called "offsets" to meet carbon emissions requirements. Offsets were emission rights that are created through the sponsorship of a project that results in reduced emissions. For example, by sponsoring a project in China, a German utility would obtain offsets for

the emissions from its coal generating plant in the Ruhr. By restricting the ability to use offset credits, the EU is hoping to boost the value of emissions certificates. Yet the fundamental problem does not lie with offsets. Rather, it lies with the EU's original decision to grant a volume of emissions certificates that was based on a set of economic growth and industry emissions estimates. When those proved overoptimistic, the value of the emissions certificates fell. It is also interesting to speculate on what would have happened if the EU had originally issued a smaller volume of emissions rights. Their initial price would have been higher, which logically would have stimulated more actions by industry, including greater investment in emissions reductions projects, offset projects outside of the EU, and perhaps the closure of some facilities or their relocation to less environmentally demanding countries. Emissions reductions projects, closures and relocations might have led to a fall in the value of the emissions certificates, depending on their success (i.e., if the realized emissions reduction was greater than the amount assumed when the certificates were issued, prices would fall, all else being equal). But when GDP contracted, emissions would have fallen still further, and with them the price of the emissions certificates. In sum, it is hard for us to see a way in which tradable carbon emissions rights will not share a strong relationship to GDP growth with equities and industrial commodities. If anything, we could more easily see them being included in a commodities index fund than as a stand alone asset class, assuming the Obama cap and trade proposal is eventually enacted into law.

How have your model portfolios performed over the last five years?

As you would expect, this is not an easy question to answer, for four main reasons. First, we offer a wide range of model portfolios, with long term real rate of return targets ranging from 2% to 7%, in eight currencies, including AUD, CAD, CHF, EUR, GBP, INR, JPY and USD. Second, the actual return from any of our model portfolios depends on your assumptions about when and how the investment was made. For example, we have repeatedly stressed the importance of not investing new money in asset classes that we believed to be overvalued, just to achieve a given asset

allocation target in a given timeframe. Third, there is the question of what rebalancing strategy was being used during the performance evaluation period. Fourth, and most important, there is the question of whether and to what extent an investor followed our recommendations from May 2007 onward to reduce asset class exposures and increase liquid asset holdings.

With those caveats in mind, let's take a look at the compound annual real returns that some of our model portfolios experienced over the five years ended in 2008. We will focus on our USD 4% and USD 5% target real return portfolios, as they are in the middle of the distribution of institutional and individual investors' needs. We should also make a few points about the data series we use in our analysis. Almost all of them reflect the returns on funds available to individual investors. An exception is uncorrelated alpha strategies, where our fund selections only began in 2007. For the years before this, we use the Tremont Equity Market Neutral Index return. Also, for timber, we have used only the return on Plum Creek Timber (PCL), as Rayonier was, during this period, going through the process of converting to a timber REIT. All nominal returns were converted to real returns using the U.S. Consumer Price Index. The following table presents some benchmark data, including the five year compound annual return and maximum monthly drawdown for three strategies: (1) a constant allocation of 40% to domestic bonds and 60% to domestic equity; (2) a constant equally weighted allocation to ten asset classes (real return bonds, domestic bonds, unhedged foreign currency bonds, domestic commercial property securities, unhedged foreign commercial property securities, long commodities (DJAIG), timber (PCL), domestic equity, unhedged foreign developed market equity, and emerging markets equity; and (3) a constant equally weighted allocation to these ten asset classes plus uncorrelated alpha strategies.

Benchmark Portfolios	2004-2008 Compound Annual Real Return	2004-2008 Maximum Monthly Real Drawdown in Portfolio Value
60/40	(1.7%)	(12.7%)

Equally Weighted 10	0.6%	(18.1%)
Equally Weighted 11	0.4%	(16.8%)

The next table presents the same data for four portfolios: our 4% and 5% target real return portfolios, with and without the use of uncorrelated alpha strategies. It also shows the impact of acting on our May 2007 warning. In this analysis, we assume that 50% of the portfolio's value was moved into liquid investments in July 2007 (which we assume is then split 45% in short term U.S. Treasury Bonds and 5% in gold) while the remaining 50% continues to be invested using our target asset allocation.

Index Investor Model Portfolios	2004-2008 Compound Annual Real Return	2004-2008 Maximum Monthly Drawdown
USD 4%	1.7%	(12.3%)
USD 4% with High Liquidity	4.3%	(6.0%)
USD 4% with Uncor Alpha Strats	0.6%	(12.5%)
USD 4% with Uncor Alpha Strats and High Liquidity	3.9%	(6.1%)
USD 5%	0.5%	(13.4%)
USD 5% with High Liquidity	3.8%	(6.5%)
USD 5% with Uncor Alpha Strats	0.3%	(13.4%)
USD 5% with Uncor Alpha Strats and High Liquidity	3.8%	(6.5%)

The next two tables show the impact of different rebalancing strategies on the five year compound annual real return delivered by our basic 4% and 5% model portfolios, without assuming any move to increase liquidity in July 2007. As long-term subscribers know, our approach to rebalancing involves two factors: a trigger and an adjustment factor. Rebalancing is initiated whenever one or more asset classes is over or under its target weight by an amount equal to or greater than the trigger. In the following tables, we use triggers of 5%, 7.5%, and 10%. For example, if we were

using the 10% trigger, and an asset class had a target portfolio weight of 30%, rebalancing would be initiated if its actual weight was at or above 40% or at or below 20%. Our analysis also assumes a cost of 50 basis points times the actual amount of assets shifted during the rebalancing. Our approach to rebalancing also assumes that investor behavior causes asset class returns to over and undershoot fair valuation and consequently mean revert over time. Hence, we believe there is an opportunity to systematically add small amounts to portfolio returns by exploiting this tendency to mean revert. This is the purpose of our adjustment factor. Whenever a rebalancing is triggered, we identify the two asset classes that are the most above and below their target weights. We rebalance the overweight asset class to a weight equal to its target less the adjustment factor (e.g., 15% - 5% = 10%), and the most underweight asset class to a weight equal to its target plus the adjustment factor (e.g., 20% + 5% = 25%). Put differently, our trigger sets a limit on the amount of risk taken on from riding potential bubbles before rebalancing, while our adjustment factor sets a limit on the amount of risk taken on in pursuit of additional returns from mean reversion.

The following two tables show the impact on five year compound annual real returns of using different triggers and adjustment factors in combination with our basic USD 4% and USD 5% target real return portfolios.

4% Target Return Portfolio with Alternative Rebalancing Strategies
Compound Annual Real Return 2004-2008

Trigger (below) and Adjustment Factor (right)	0% (Rebalance back to Target)	2.5%	5.0%
10%	1.1%	1.1%	1.1%
7.5%	2.7%	2.7%	3.0%
5.0%	1.9%	1.9%	1.8%

5% Target Return Portfolio with Alternative Rebalancing Strategies
Compound Annual Real Return 2004-2008

Trigger (below) and Adjustment Factor (right) 5% Target Return Portfolio	0% (Rebalance back to Target)	2.5%	5.0%

10%	1.9%	2.2%	2.2%
7.5%	1.2%	1.3%	1.5%
5.0%	0.6%	0.6%	0.6%

We draw a number of conclusions from this analysis. First, a frequently heard saying these days is that, given the radical disruptions to financial markets over the past two years, the true test of an investment strategy has become "return of capital, not return on capital." Our USD 4% and USD 5% model portfolios have passed this (cynical) test, and in fact delivered positive real returns, even in their simplest (monthly rebalancing to target weights) implementation. They have also exceeded the real returns on common benchmark portfolios. Moreover, with the use of more advanced rebalancing strategies, these two model portfolios have come even closer to achieving their target real returns, despite the market challenges they faced over the past five years. Finally, it is clear that the impact of following our recommendation and raising liquidity in mid-2007 had a critical impact on realized five year compound annual real returns.

Are we satisfied with our portfolios performance over the past five years? If you include the impact of acting on our May 2007 (and subsequently repeated) recommendation to increase liquidity and decrease allocations to overvalued asset classes, the answer is yes. We got it right when many very smart people got it wrong, and cost their clients a lot of money and not a few hopes and dreams. Yet as we describe in this month's Product and Strategy Notes, we think there is still room for improving our methodologies, based on what we have learned from the past five years' experience. So in that sense, the answer is no. On balance, our model portfolios' basic asset allocations helped avoid the worst of the downside moves, and that our rebalancing strategies and the warnings based on our asset class valuation and scenario analysis methodology further reduced exposure to large downside losses. As a result, these model portfolios have an excellent chance of achieving their long-term targets, and thus the financial and life goals that are predicated on those returns. Given the challenges of the past few years, that is no mean feat – but we're still striving to do even better in the future.

Global Asset Class Returns

YTD 31Mar2009	In USD	In AUD	In CAD	In EURO	In JPY	In GBP	In CHF	In INR
Asset Held								
USD Bonds	0.34%	0.68%	2.22%	4.83%	8.55%	0.65%	6.74%	4.31%
USD Prop.	-32.08%	-31.74%	-30.20%	-27.59%	-23.87%	-31.77%	-25.68%	-28.11%
USD Equity	-10.73%	-10.39%	-8.85%	-6.24%	-2.52%	-10.42%	-4.33%	-6.76%
AUD Bonds	-5.48%	-5.13%	-3.60%	-0.99%	2.73%	-5.17%	0.92%	-1.51%
AUD Prop.	-22.55%	-22.20%	-20.67%	-18.06%	-14.33%	-22.24%	-16.15%	-18.57%
AUD Equity	-4.43%	-4.08%	-2.55%	0.06%	3.79%	-4.12%	1.97%	-0.45%
CAD Bonds	-1.81%	-1.47%	0.06%	2.67%	6.40%	-1.51%	4.58%	2.16%
CAD Prop.	-11.84%	-11.50%	-9.96%	-7.35%	-3.63%	-11.53%	-5.44%	-7.87%
CAD Equity	-5.57%	-5.22%	-3.69%	-1.08%	2.65%	-5.26%	0.83%	-1.59%
CHF Bonds	2.77%	3.11%	4.65%	7.26%	10.98%	3.08%	9.17%	6.74%
CHF Prop.	-8.92%	-8.58%	-7.04%	-4.43%	-0.71%	-8.61%	-2.52%	-4.95%
CHF Equity	-17.85%	-17.51%	-15.98%	-13.36%	-9.64%	-17.55%	-11.46%	-13.88%
INR Bonds	-14.13%	-13.79%	-12.26%	-9.64%	-5.92%	-13.83%	-7.74%	-10.16%
INR Equity	-3.34%	-2.99%	-1.46%	1.15%	4.88%	-3.03%	3.06%	0.63%
EUR Bonds	-4.88%	-4.53%	-3.00%	-0.39%	3.34%	-4.57%	1.52%	-0.91%
EUR Prop.	-14.06%	-13.72%	-12.19%	-9.57%	-5.85%	-13.76%	-7.67%	-10.09%
EUR Equity	-9.98%	-9.64%	-8.10%	-5.49%	-1.77%	-9.67%	-3.58%	-6.01%
JPY Bonds	-9.97%	-9.63%	-8.10%	-5.49%	-1.76%	-9.67%	-3.58%	-6.00%
JPY Prop.	-12.57%	-12.23%	-10.69%	-8.08%	-4.36%	-12.26%	-6.17%	-8.60%
JPY Equity	-17.54%	-17.19%	-15.66%	-13.05%	-9.32%	-17.23%	-11.14%	-13.57%
GBP Bonds	-1.23%	-0.89%	0.64%	3.26%	6.98%	-0.93%	5.16%	2.74%
GBP Prop.	-31.08%	-30.73%	-29.20%	-26.59%	-22.86%	-30.77%	-24.68%	-27.10%
GBP Equity	-14.45%	-14.10%	-12.57%	-9.96%	-6.24%	-14.14%	-8.05%	-10.48%
1-3 Yr US Govt	0.31%	0.65%	2.19%	4.80%	8.52%	0.62%	6.71%	4.28%
World Bonds	-2.09%	-1.75%	-0.21%	2.40%	6.12%	-1.79%	4.31%	1.88%
World Prop.	-25.41%	-25.07%	-23.53%	-20.92%	-17.20%	-25.11%	-19.01%	-21.44%
World Equity	-12.22%	-11.88%	-10.34%	-7.73%	-4.01%	-11.91%	-5.82%	-8.25%
Commod Long	-6.08%	-5.74%	-4.20%	-1.59%	2.13%	-5.78%	0.32%	-2.11%
Commod L/Shrt	-6.60%	-6.25%	-4.72%	-2.11%	1.62%	-6.29%	-0.20%	-2.63%
Gold	4.35%	4.69%	6.22%	8.83%	12.56%	4.65%	10.74%	8.32%
Timber	-15.90%	-15.56%	-14.03%	-11.42%	-7.69%	-15.60%	-9.51%	-11.93%
Uncorrel Alpha	0.71%	1.05%	2.58%	5.19%	8.92%	1.01%	7.10%	4.68%
Volatility VIX	10.35%	10.69%	12.23%	14.84%	18.56%	10.66%	16.75%	14.32%
Currency								
AUD	-0.34%	0.00%	1.53%	4.14%	7.87%	-0.04%	6.05%	3.63%
CAD	-1.88%	-1.53%	0.00%	2.61%	6.34%	-1.57%	4.52%	2.09%

YTD 31Mar2009	In USD	In AUD	In CAD	In EURO	In JPY	In GBP	In CHF	In INR
EUR	-4.49%	-4.14%	-2.61%	0.00%	3.72%	-4.18%	1.91%	-0.52%
JPY	-8.21%	-7.87%	-6.34%	-3.72%	0.00%	-7.91%	-1.82%	-4.24%
GBP	-0.31%	0.04%	1.57%	4.18%	7.91%	0.00%	6.09%	3.66%
USD	0.00%	0.34%	1.88%	4.49%	8.21%	0.31%	6.40%	3.97%
CHF	-6.40%	-6.05%	-4.52%	-1.91%	1.82%	-6.09%	0.00%	-2.43%
INR	-3.97%	-3.63%	-2.09%	0.52%	4.24%	-3.66%	2.43%	0.00%

Uncorrelated Alpha Strategies Detail

YTD 31Mar2009	In USD	In AUD	In CAD	In EURO	In JPY	In GBP	In CHF	In INR
Eq Mkt Neutral								
HSKAX	-2.01%	-1.67%	-0.14%	2.48%	6.20%	-1.71%	4.38%	1.96%
OGNAX	-3.48%	-3.13%	-1.60%	1.01%	4.74%	-3.17%	2.92%	0.50%
Arbitrage								
ARBFX	2.45%	2.80%	4.33%	6.94%	10.67%	2.76%	8.85%	6.42%
ADANX	0.90%	1.24%	2.78%	5.39%	9.11%	1.21%	7.30%	4.87%
Currency								
DBV	5.66%	6.01%	7.54%	10.15%	13.88%	5.97%	12.06%	9.64%
ICI	1.97%	2.31%	3.85%	6.46%	10.18%	2.28%	8.37%	5.94%
Equity L/S								
HSGFX	7.03%	7.38%	8.91%	11.52%	15.25%	7.34%	13.43%	11.00%
PTFAX	-4.18%	-3.83%	-2.30%	0.31%	4.04%	-3.87%	2.22%	-0.21%
GTAA								
MDLOX	-5.28%	-4.93%	-3.40%	-0.79%	2.94%	-4.97%	1.12%	-1.31%
PASAX	-3.39%	-3.04%	-1.51%	1.10%	4.83%	-3.08%	3.01%	0.58%

Asset Class Valuation Update

Our asset class valuation analyses are based on the belief that financial markets are complex adaptive systems, in which prices and returns emerge from the interaction of multiple rational, emotional and social processes. We further believe that while this system is attracted to equilibrium, it is generally not in this state. To put it differently, we believe it is possible for the supply of future returns a market is expected to provide to be higher or lower than the returns investors logically demand, resulting in over or undervaluation. The attraction of the system to equilibrium means that, at some point, these situations are likely to reverse in the direction of their fundamental valuation. However, the complex adaptive nature of the system means that it is difficult if not impossible to accurately forecast how and when such reversals will occur. Yet this does not mean that valuation analyses are a fruitless enterprise. Far from it. For an investor trying to achieve a multiyear goal (e.g., accumulating a certain amount of capital in advance of retirement, and later trying to preserve the real value of that capital as one generates income from it), avoiding large downside losses is mathematically more important than reaching for the last few basis points of return. Investors who use valuation analyses to help them limit downside risk when an asset class appears to be substantially overvalued can substantially increase the probability that they will achieve their long term goals. This is the painful lesson learned by too many investors in the 2001 tech stock crash, and then learned again in the 2007-2008 crash of multiple asset classes.

We also believe that the use of a consistent quantitative approach to assessing fundamental asset class valuation helps to overcome normal human tendencies towards over-optimism, overconfidence, wishful thinking, and other biases that can cause investors to make decisions they later regret. Finally, we stress that our monthly market valuation update is only a snapshot in time, and says nothing about whether apparent over and undervaluations will in the future become more extreme before they inevitably reverse. That said, when momentum is strong and quickly moving prices far away from their fundamental values, it is usually a good indication a turning point is near.

In the case of an equity market, we define the future supply of returns to be equal to the current dividend yield plus the rate at which dividends are expected to grow in the future. We define the return investors demand as the current yield on real return government bonds plus an equity market risk premium. While this approach emphasizes fundamental valuation, it does have an implied linkage to the investor behavior factors that also affect valuations. On the supply side of our framework, investors under the influence of fear or euphoria (or social pressure) can deflate or inflate the long-term real growth rate we use in our analysis. Similarly, fearful investors will add an uncertainty premium to our long-term risk premium, while euphoric investors will subtract an "overconfidence discount." As you can see, euphoric investors will overestimate long-term growth, underestimate long-term risk, and consequently drive prices higher than warranted. In our framework, this depresses the dividend yield, and will cause stocks to appear overvalued. The opposite happens under conditions of intense fear. To put it differently, in our framework, it is investor behavior and overreaction that drive valuations away from the levels warranted by the fundamentals. As described in our November 2008 article "Are Emerging Market Equities Undervalued?", people can and do disagree about the "right" values for the variables we use in our fundamental analysis. Recognizing this, we present four valuation scenarios for an equity market, based on different values for three key variables. First, we use both the current dividend yield and the dividend yield adjusted upward by .50% to reflect share repurchases. Second, we define future dividend growth to be equal to the long-term rate of total (multifactor) productivity growth. For this variable, we use two different values, 1% or 2%. Third, we also use two different values for the equity risk premium required by investors: 2.5% and 4.0%. Different combinations of all these variables yield high and low scenarios for both the future returns the market is expected to supply (dividend yield plus growth rate), and the future returns investors will demand (real bond yield plus equity risk premium). We then use the dividend discount model to combine these scenarios, to produce four different views of whether an equity market is over, under, or fairly valued today. The specific formula is (Current Dividend Yield x 100) x (1+ Forecast Productivity Growth)

divided by (Current Yield on Real Return Bonds + Equity Risk Premium - Forecast Productivity Growth). Our valuation estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation. In our view, the greater the number of scenarios that point to overvaluation or undervaluation, the greater the probability that is likely to be the case.

Equity Market Valuation Analysis at 31 March 2009

Australia	Low Demanded Return	High Demanded Return
High Supplied Return	38%	59%
Low Supplied Return	57%	80%

Canada	Low Demanded Return	High Demanded Return
High Supplied Return	62%	102%
Low Supplied Return	103%	150%

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Eurozone	Low Demanded Return	High Demanded Return
High Supplied Return	35%	54%
Low Supplied Return	51%	72%

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Japan	Low Demanded Return	High Demanded Return
High Supplied Return	102%	144%
Low Supplied Return	153%	202%

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United Kingdom	Low Demanded Return	High Demanded Return
High Supplied Return	26%	52%
Low Supplied Return	48%	77%

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United States	Low Demanded Return	High Demanded Return
High Supplied Return	65%	109%
Low Supplied Return	112%	163%

Switzerland	Low Demanded Return	High Demanded Return
High Supplied Return	59%	94%
Low Supplied Return	95%	172%

India	Low Demanded Return	High Demanded Return
High Supplied Return	62%	123%
Low Supplied Return	131%	208%

Emerging Markets	Low Demanded Return	High Demanded Return
High Supplied Return	62%	123%
Low Supplied Return	131%	208%

In our view, the key point to keep in mind with respect to equity market valuations is the level of the current dividend yield, which history has shown to be the key driver of long-term real equity returns in most markets. The recent rise in uncertainty has undoubtedly increased many investors' required risk and uncertainty premium above the long-term average, while simultaneously decreasing their long-term real growth forecasts. The net result has been a sharp fall in equity prices that has caused dividend yields to increase. From the perspective of an investor with long-term risk and growth assumptions in the range we use in our model, this increase in dividend yields has more than offset the simultaneous rise in real bond yields, and caused at least some equity markets to appear undervalued. That said, many companies are cutting dividends at a pace not seen since the 1930s. Hence the numerator of our dividend/yield calculation may well further decline in the months ahead, which, all else being equal, should further depress prices. In sum, we believe that rather than trying

to catch the bottom of different equity markets, most investors are best advised to either wait or commence a staged increase in their equity allocations.

Our government bond market valuation update is based on the same supply and demand methodology we use for our equity market valuation update. In this case, the supply of future fixed income returns is equal to the current nominal yield on ten-year government bonds. The demand for future returns is equal to the current real bond yield plus historical average inflation between 1989 and 2003. We use the latter as a proxy for the average rate of inflation likely to prevail over a long period of time. To estimate of the degree of over or undervaluation for a bond market, we use the rate of return supplied and the rate of return demanded to calculate the present values of a ten year zero coupon government bond, and then compare them. If the rate supplied is higher than the rate demanded, the market will appear to be undervalued. This information is contained in the following table:

Bond Market Analysis as of 31 Mar 09

	Current Real Rate*	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Yield Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
Australia	2.23%	2.96%	5.19%	4.63%	-0.56%	5.48%
Canada	1.84%	2.40%	4.24%	2.80%	-1.44%	14.92%
Eurozone	2.19%	2.37%	4.56%	2.99%	-1.57%	16.33%
Japan	3.13%	0.77%	3.90%	1.36%	-2.54%	28.08%
UK	1.03%	3.17%	4.20%	3.13%	-1.07%	10.87%
USA	1.77%	2.93%	4.70%	2.70%	-2.00%	21.27%
Switz.	2.03%	2.03%	4.06%	2.17%	-1.89%	20.14%
India	2.03%	7.57%	9.60%	7.44%	-2.16%	22.05%

*For Switzerland and India, we use the average of real rates in other regions with real return bond markets

It is important to note some important limitations of this analysis. Our bond market analysis uses historical inflation as an estimate of expected future inflation.

This may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of future average inflation levels. The following table, which shows historical average inflation rates (and their standard deviations) for the U.K. and U.S. over longer periods of time than the ones we have used, helps to put the possible size of any estimation and valuation errors into context:

	U.K.	*U.S.*
Avg. Inflation, 1775-2007	2.19%	1.62%
Standard Deviation	6.60%	6.51%
Avg. Inflation, 1908-2007	4.61%	3.29%
Standard Deviation	6.24%	5.03%
Avg. Inflation, 1958-2007	5.98%	4.11%
Standard Deviation	5.01%	2.84%

If future inflation is expected to be lower than the inflation assumption we have used in our valuation analysis, then required returns should be lower. All else being equal, this would reduce any estimated overvaluation. In this regard, the difference between yields on ten year U.S. government nominal and inflation linked bonds is about one percent, is a rough proxy for the expected future rate of inflation (we say rough because it technically includes not only the expected inflation rate, but also a further premium for inflation risk). This value is currently well below the average historical rate of inflation we have used in our analysis.

Let us now move on to a closer look at the current level of real interest rates. In keeping with our basic approach, we will start by looking at the theoretical basis for determining the rate of return an investor should demand in exchange for making a one year risk free investment. The so-called Ramsey equation tells us that this should be a function of a number of variables. The first is our "time preference", or the rate at which we trade-off a unit of consumption in the future for one today, assuming no growth in the amount of goods and services produced by the economy. As is often the case, the correct value for this parameter is the subject of much debate. For example, this lies at the heart of the debate over how much we should be willing to spend today to limit the worst effects of climate change in the future. In our analysis, we assume

the average time preference is two percent per year. However, it is not the case that the economy does not grow; hence, the risk free rate we require should reflect the fact that there will be more goods and services available in the future than there are today. Assuming investors try to smooth their consumption over time, the risk free rate should also contain a term that takes the growth rate of the economy into account. Broadly speaking, this growth rate is a function of the increase in the labor supply and the increase in labor productivity. However, the latter comes from both growth in the amount of capital per worker and from growth in "total factor productivity", which is due to a range of factors, including better organization, technology and education. Since capital/worker cannot be increased without limit, over the long-run it is growth in total factor productivity that counts. Hence, in our analysis, we assume that future economic growth reflects the growth in the labor force and TFP. However, this future growth is not guaranteed; rather, there is an element of uncertainty involved. Hence we also need to take investor's aversion to risk and uncertainty into account when estimating the risk free rate of return they should require in exchange for letting others use their capital for one year. There are many ways to measure this, and unsurprisingly, many people disagree on the right approach to use. In our analysis, we have used Constant Relative Risk Aversion with an average value of three (see "How Risk Averse are Fund Managers?" by Thomas Flavin). The following table brings these factors together to determine our estimate of the risk free rate investors in different currency zones should logically demand in equilibrium (for an excellent discussion of the issues noted above, and their practical importance, see "The Stern Review of the Economics of Climate Change" by Martin Weitzman):

Region	Labor Force Growth %	TFP Growth %	Steady State Econ Growth %	Std Dev of Econ Growth Rate %	Time Preference %	Risk Aversion Factor	Risk Free Rate Demanded* %
Australia	1.0	1.20	2.2	1.1	2.0	3.0	3.2
Canada	0.8	1.00	1.8	0.9	2.0	3.0	3.8
Eurozone	0.4	1.20	1.6	0.8	2.0	3.0	3.9
Japan	-0.3	1.20	0.9	0.5	2.0	3.0	3.8

Region	Labor Force Growth %	TFP Growth %	Steady State Econ Growth %	Std Dev of Econ Growth Rate %	Time Preference %	Risk Aversion Factor	Risk Free Rate Demanded* %
United Kingdom	0.5	1.20	1.7	0.9	2.0	3.0	3.8
United States	0.8	1.20	2.0	1.0	2.0	3.0	3.5

- The risk free rate equals time preference plus (risk aversion times growth) less (.5 times risk aversion squared times the standard deviation of growth squared).

The next table compares this long-term equilibrium real risk free rate with the real risk free return that is currently supplied in the market. Negative values indicate that real return bonds are currently overvalued, as their prices must fall in order for their yields (i.e., the returns they supply) to rise:

Region	Risk Free Rate Demanded	Actual Risk Free Rate Supplied	Difference	Overvaluation (>100) or Undervaluation (<100)
Australia	3.2	2.2	-0.9	141
Canada	3.8	1.8	-1.9	204
Eurozone	3.9	2.2	-1.7	179
Japan	3.8	3.1	-0.7	121
United Kingdom	3.8	1.0	-2.8	374
United States	3.5	1.8	-1.7	198

We reiterate that this analysis is based on a medium term view of the logical value of the risk free real return investors should demand. For example, plunging consumer spending around the world implies a lower time preference rate than the 2.0% we have used in our analysis, which would reduce the apparent overvaluation of this asset class.

Let us now turn to the subject of the valuation of non-government bonds. Some have suggested that it is useful to decompose the bond yield spread into two parts. The first is the difference between the yield on AAA rated bonds and the yield on the

ten year Treasury bond. Because default risk on AAA rated companies is very low, this spread may primarily reflect prevailing liquidity and jump (regime shift) risk conditions (e.g., between a low volatility, relatively high return regime, and a high volatility, lower return regime). The second is the difference between BAA and AAA rated bonds, which may tell us more about the level of compensation required by investors for bearing relatively high quality credit risk. For example, between August and October, 1998 (around the time of the Russian debt default and Long Term Capital Management crises), the AAA-Treasury spread jumped from 1.18% to 1.84%, while the BAA-AAA spread increased by much less, from .62% to .81%.   This could be read as an indication of investor's higher concern with respect to the systematic risk implications of these crises (i.e., their potential to shift the financial markets into the low return, high volatility regime), and lesser concern with respect to their impact on the overall pricing of credit risk.

The following table shows the statistics of the distribution of these spreads between January, 1986 and December, 2008 (based on daily Federal Reserve data – 11,642 data points). Particularly in the case of the BAA spread, it is clear we are not dealing with a normal distribution!

	AAA – 10 Year Treasury	BAA-AAA
Average	1.20%	.94%
Standard Deviation	.44%	.34%
Skewness	.92	3.11
Kurtosis	.53	17.80

At **31 March 2009**, the AAA minus 10 year Treasury spread was 2.73%. The AAA minus BAA spread was 3.05%. Since these distributions are not normal (i.e., they do not have a "bell curve" shape), we will take a different approach to putting them in perspective. Over the past twenty three years, there have been only 4 days with a higher AAA spread (.03% of all days) and 36 days with a higher BAA spread (.31%). Clearly, current spreads reflect severe investor uncertainty about both liquidity

and credit risk. However, given the unchartered economic waters through which we are now passing, it is not yet clear to us whether these spreads represent the over, under, or fair valuation of liquidity and credit risk.

Let us now turn to currency valuations. For an investor contemplating the purchase of foreign bonds or equities, the expected future annual percentage change in the exchange rate is also important. Study after study has shown that there is no reliable way to forecast this, particularly in the short term. At best, you can make an estimate that is justified in theory, knowing that in practice it will not turn out to be accurate, especially over short periods of time. In our case, we have taken the difference between the yields on ten-year government bonds as our estimate of the likely future annual change in exchange rates between two regions. According to theory, the currency with the relatively higher interest rates should depreciate versus the currency with the lower interest rates. Of course, in the short term this often doesn't happen, which is the premise of the popular hedge fund "carry trade" strategy of borrowing in low interest rate currencies, investing in high interest rate currencies, and, essentially, betting that the change in exchange rates over the holding period for the trade won't eliminate the potential profit. Because (as noted in our June 2007 issue) there are some important players in the foreign exchange markets who are not profit maximizers, carry trades are often profitable, at least over short time horizons. Our expected medium to long-term changes in exchange rates are summarized in the following table:

Annual Exchange Rate Changes Implied by Bond Market Yields on 31Mar09

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-1.83%	-1.64%	-3.27%	-1.50%	-1.93%	-2.46%	2.81%
CAD	1.83%	0.00%	0.19%	-1.44%	0.33%	-0.10%	-0.63%	4.64%
EUR	1.64%	-0.19%	0.00%	-1.63%	0.14%	-0.29%	-0.82%	4.45%
JPY	3.27%	1.44%	1.63%	0.00%	1.77%	1.34%	0.81%	6.08%
GBP	1.50%	-0.33%	-0.14%	-1.77%	0.00%	-0.43%	-0.96%	4.31%
USD	1.93%	0.10%	0.29%	-1.34%	0.43%	0.00%	-0.53%	4.74%
CHF	2.46%	0.63%	0.82%	-0.81%	0.96%	0.53%	0.00%	5.27%
INR	-2.81%	-4.64%	-4.45%	-6.08%	-4.31%	-4.74%	-5.27%	0.00%

Our approach to valuing commercial property securities as an asset class is also based on the expected supply of and demand for returns, utilizing the same mix of fundamental and investor behavior factors we use in our approach to equity valuation. Similar to equities, the supply of returns equals the current dividend yield plus the expected real growth rate of net operating income (NOI). A number of studies have found that real NOI growth has been basically flat over long periods of time (with apartments showing the strongest rates of real growth). This is in line with what economic theory predicts, with rapid increases in rent attracting new property investors, finance the construction of new space which, when it comes onto the market, causes rents to fall. Our analysis also assumes that over the long-term, investors require a 2.5% risk premium above the yield on real return bonds as compensation for bearing the risk of securitized commercial property as an asset class.   Last but not least, there is significant research evidence that commercial property markets are frequently out of equilibrium, due to the interaction between fundamental factors and investors' emotions (see, for example, "Investor Rationality: An Analysis of NCREIF Commercial Property Data" by Hendershott and MacGregor; "Real Estate Market Fundamentals and Asset Pricing" by Sivitanides, Torto, and Wheaton; "Expected Returns and Expected Growth in Rents of Commercial Real Estate" by Plazzi, Torous, and Valkanov; and "Commercial Real Estate Valuation: Fundamentals versus Investor Sentiment" by Clayton, Ling, and Naranjo). Hence, it is extremely hard to forecast how long it will take for any over or undervaluations we identify to be reversed. The following table shows the results of our valuation analysis as of **31 March 2009**:

Country	Dividend Yield	Plus LT Real Growth Rate	Equals Supply of Returns	Real Bond Yield	Plus LT Comm Prop Risk Premium	Equals Returns Demanded	Over or Undervaluation (100% = Fair Value)
Australia	10.4%	0.2%	10.6%	2.2%	2.5%	4.7%	43.5%
Canada	13.2%	0.2%	13.4%	1.8%	2.5%	4.3%	31.3%
Eurozone	9.7%	0.2%	9.9%	2.2%	2.5%	4.7%	46.2%

Country	Dividend Yield	Plus LT Real Growth Rate	Equals Supply of Returns	Real Bond Yield	Plus LT Comm Prop Risk Premium	Equals Returns Demanded	Over or Undervaluation (100% = Fair Value)
Japan	7.9%	0.2%	8.1%	3.1%	2.5%	5.6%	68.6%
Switzerland	1.5%	0.2%	1.7%	2.0%	2.5%	4.5%	288.2%
U.K.	8.5%	0.2%	8.7%	1.0%	2.5%	3.5%	39.1%
United States	11.2%	0.2%	11.4%	1.8%	2.5%	4.3%	36.3%

Let us now turn to the Dow Jones AIG Commodity Index, our preferred benchmark for this asset class because of the roughly equal weights it gives to energy, metals and agricultural products. One of our core assumptions is that financial markets function as a complex adaptive system which, while attracted to equilibrium (which generates mean reversion) are seldom in it. To put it differently, we believe that investors' expectations for the returns an asset class is expected to supply in the future are rarely equal to the returns a rational long-term investor should logically demand. Hence, rather than being exceptions, over and undervaluations of different degrees are simply a financial fact of life. We express the demand for returns from an asset class as the current yield on real return government bonds (ideally of intermediate duration) plus an appropriate risk premium. While the former can be observed, the latter is usually the subject of disagreement. In determining the risk premium to use, we try to balance a variety of inputs, including historical realized premiums (which may differ considerably from those that were expected, due to unforeseen events), survey data and academic theory (e.g., assets that payoff in inflationary and deflationary states should command a lower risk premium than those whose payoffs are highest in "normal" periods of steady growth and modest changes in the price level). In the case of commodities, Gorton and Rouwenhorst (in their papers "Facts and Fantasies About Commodity Futures" and "A Note on Erb and Harvey") have shown that (1) commodity index futures provide a good hedge against unexpected inflation; (2) they also tend to hedge business cycle risk, as the peaks and troughs of their returns tend to lag behind those on equities (i.e., equity returns are leading indicators, while commodity returns are coincident indicators of the state of the real business cycle); and (3) the realized

premium over real bond yields has historically been on the order of four percent. We are inclined to use a lower ex-ante risk premium in our analysis (though reasonable people can still differ about what it should be), because of the hedging benefits commodities provide relative to equities. This is consistent with the history of equities, where realized ex-post premiums have been shown to be larger than the ex-ante premiums investors should logically have expected.

The general form of the supply of returns an asset class is expected to generate in the future is its current yield (e.g., the dividend yield on equities), plus the rate at which this stream of income is expected to grow in the future. The key challenge with applying this framework to commodities is that the supply of commodity returns doesn't obviously fit into this framework. Broadly speaking, the supply of returns from an investment in commodity index futures comes from four sources. First, since commodity futures contracts can be purchased for less than their face value (though the full value has to be delivered if the contract is held to maturity), a commodity fund manager doesn't have to spend the full $100 raised from investors to purchase $100 of futures contracts. The difference is invested – usually in government bonds – to produce a return.

The second source of the return on a long-only commodity index fund is the so-called "roll yield." Operationally, a commodity index fund buys futures contracts in the most liquid part of the market, which is usually limited to the near term. As these contracts near their expiration date, they are sold and replaced with new futures contracts. For example, a fund might buy contracts maturing in two or three months, and sell them when they approached maturity. The "roll yield" refers to the gains and losses realized by the fund on these sales. If spot prices (i.e., the price to buy the physical commodity today, towards which futures prices will move as they draw closer to expiration) are higher than two or three month futures, the fund will be selling high and buying low, and thus earning a positive roll yield. When a futures market is in this condition, it is said to be in "backwardation." On the other hand, if the spot price is lower than the two or three month's futures price, the market is said to be in "contango" and the roll yield will be negative (i.e., the fund will sell low and buy high).

The interesting issue is what causes a commodity to be either backwardated or contangoed. A number of theories have been offered to explain this phenomenon. The one that seems to have accumulated the most supporting evidence to date is the so-called "Theory of Storage": begins with the observation that, all else being equal, contango should be the normal state of affairs, since a person buying a commodity at spot today and wishing to lock in a profit by selling a futures contract will have to incur storage and financing costs. In addition to his or her profit margin, storage and financing costs should cause the futures price to be higher than the spot price, and normal roll yields to be negative.

However, in the real world, all things are not equal. For example, some commodities are very difficult or expensive to store; others have very high costs if you run out of them (e.g., because of rapidly rising demand relative to supply, or a potential disruption of supply). For these commodities, there may be a significant option value to holding the physical product (the Theory of Storage refers to this option value as the "convenience yield"). If this option value is sufficiently high, spot prices may be bid up above futures prices, causing "backwardation" and positive roll-yields for commodity index funds. Hence, a key question is the extent to which different commodities within a given commodity index tend to be in backwardation or contango over time. Historically, most commodities have spent time in both states. However, contango has generally been more common, but not equally so for all commodities. For example, oil has spent relatively more time in backwardation, as have copper, sugar, soybean meal and lean hogs. This highlights a key point about commodity futures index funds – because of the critical impact of the commodities they include, the weights they give them, and their rebalancing and rolling strategies, they are, in effect, uncorrelated alpha strategies. Moreover, because of changing supply and demand conditions in many commodities (e.g., global demand has been growing, while marginal supplies are more expensive to develop and generally have long lead times), it is not clear that historical tendencies toward backwardation or contango are a good guide to future conditions. To the extent that any generalizations can be made, higher real option values, and hence backwardation and positive roll returns are more likely to

be found when demand is strong and supplies are tight, and/or when there is a rising probability of a supply disruption in a commodity where storage is difficult. For example, ten commodities make up roughly 75% of the value of the Dow Jones AIG Commodities Index. The current term structures of their futures curves are as follows:

Commodity	2009 DJAIG Weight	Current Status
Crude Oil	13.8%	Contango
Natural Gas	11.9%	Contango
Gold	7.9%	Contango
Soybeans	7.6%	Backwardated
Copper	7.3%	Contango
Aluminum	7.0%	Contango
Corn	5.7%	Contango
Wheat	4.8%	Contango
Live Cattle	4.3%	Contango
Unleaded Gasoline	3.7%	Contango
	74.0%	

While many commodity curves have improved over the past month, given the continued prevalence of so many contangoed futures curves, near term roll returns on the DJAIG should be negative, absent major supply side shocks (note that this can generate positive returns for commodity funds that can take short positions – i.e., sell rather than buy futures contracts).

The third source of commodity futures return is unexpected changes in the price of the commodity during the term of the futures contract. It is important to stress that the market's consensus about the expected change in the spot price is already included in the futures price. The source of return we are referring to here is the unexpected portion of the actual change. Again, large surprises seem more likely when supply and demand and finely balanced – the same conditions which can also give rise to changes in real option values and positive roll returns. At the present time, with economic growth weakening, demand is falling across a wide range of commodities. Hence, the source of any surprising price increases must be a changes

in expected supply that either occur suddenly and are extremely hard to forecast (e.g., a weather or terrorist related incident) or changes that investors may have not yet fully incorporated into their valuation models (e.g., the faster than expected decline in oil production from current reservoirs). This return driver probably offers investors the best chance of making profitable forecasts, since most human beings find it extremely difficult to accurately understand situations where cause and effect are significantly separated in time (e.g., failure to recognize how fast rising house prices would – albeit with a time delay – trigger an enormous increase in new supply).

The fourth source of returns for a diversified commodity index fund is generated by rebalancing a funds portfolio of futures contracts back to their target commodity weightings as prices change over time. This is analogous to an equity index having a more attractive risk/return profile than many individual stocks. This rebalancing return will be higher to the extent that price volatilities are high, and the correlations of price changes across commodities are low. Historically, this rebalancing return has been estimated to be around 2% per year, for an equally weighted portfolio of different commodities. However, as correlations have risen in recent years, the size of this return driver has probably declined – say to 1% per year.

So, to sum up, the expected supply of returns from a commodity index fund over a given period of time equals (1) the current yield on real return bonds, reduced by the percentage of funds used to purchase the futures contracts; (2) expected roll yields, adjusted for commodities' respective weights in the index; (3) unexpected spot price changes; and (4) the expected rebalancing return. Of these, the yield on real return bonds can be observed, and we can conservatively assume a long-term rebalancing return of, for example, 1.0%. These two sources of return are clearly less than the demand for returns that are equal to the real rate plus a risk premium of, say, 3.0%. The difference must be made up by a combination of roll returns (which, given the current shape of futures curves, are likely to be negative in the near term) and unexpected price changes, due to sudden changes in demand (where downside surprises currently seem more likely than upside surprises) and/or supply (where the best chance of a positive return driver seems to be incomplete investor recognition of

slowing oil production from large reservoirs and/or the medium term impact of the current sharp cutback in E&P and refining investments).

Another approach to assessing the valuation of commodities as an asset class is to compare the current value of the DJAIG Index to its long-term average. Between 1991 and 2008, the inflation adjusted (i.e., real) DJAIG had an average value of 91.61, with a standard deviation of 16.0 (skewness of .52, and kurtosis of -.13 – i.e., it was close to normal). The inflation adjusted **31 March 2009** closing value of 70.02 was 1.35 standard deviation below the long term average. Assuming the value of the index is normally distributed around its historical average (which in this case is approximately correct), a value within one standard deviation of the average should occur about 67% of the time, and a value within two standard deviations 95% of the time. Whether the current level of the inflation adjusted DJAIG signifies that commodities are undervalued depends upon one's outlook for future roll returns and price surprises. Two factors argue in favor of undervaluation: the large amount of monetary easing underway in the world (which will eventually feed through to higher inflation) and the equally large amount of fiscal stimulus being applied, and its focus on infrastructure projects and clean fuels, both of which should boost demand for commodities (and indirectly boost economic growth in commodity exporting countries like Australia and Canada). There is also the potential for commodity prices to get a further boost if countries like China choose to diversify some of their foreign exchange holdings out of the U.S. dollar and into hard assets. This conclusion also applies to gold, which should also benefit from retail flows due to the expansion of ETF products that make it a more liquid investment (particularly into those products that offer redemption in physical gold). The argument in favor of a neutral view on commodity valuations is (as more fully discussed in our Economic Update) is based on the continued failure to resolve three critical problems that underlie this global recession: excessive consumer debt, insolvent banks, and substantial world current account imbalances. Until these core issues are resolved, the impact of fiscal stimulus on global growth (and hence commodity prices) is likely to be limited, though still positive.

After weighing these two views, we conclude that commodities and gold are likely undervalued today.

Our approach to assessing the current valuation of timber is based on two publicly traded timber REITS: Plum Creek (PCL) and Rayonier (RYN). As in the case of equities, we compare the return these are expected to supply (defined as their current dividend yield plus the expected growth rate of those dividends) to the equilibrium return investors should rationally demand for holding timber assets (defined as the current yield on real return bonds plus an appropriate risk premium for this asset class). We note that, since PCL and RYN are listed securities, investors should not demand a liquidity premium for holding them, as they would in the case of an investment in a TIMO Limited Partnership (Timber Management Organization). Two of the variables we use in our valuation analysis are readily available: the dividend yields on the timber REITS and the yield on real return bonds. The other two variables have to be estimated, which presents a particularly difficult challenge with respect to the rate at which dividends will grow in the future.

In broad terms, the rate of dividend growth results from the interaction of physical, and economic processes. In the first part of the physical process, trees grow, adding a certain amount of mass each year. The exact rate depends on the mix of trees (e.g., southern pine grows much faster than northern hardwoods), on silviculture techniques employed (e.g., fertilization, thinning, etc.), and weather and other natural factors (e.g., fires, drought, and beetle invasions). In the second part of the physical process, a certain amount of trees are harvested each year, and sold to provide revenue to the timber REIT. In the economic area, three processes are important, As trees grow, they can be harvested to make increasingly valuable products, starting with pulpwood when they are young, and sawtimber when they reach full maturity. This value increasing process is known as "in-growth." The speed and extent to which in-growth increased value depends on the type of tree; in general, this process produces greater value growth for hardwoods (whose physical growth is slower) than it does for pines and other fast-growing softwoods. The second economic process (or, more accurately, processes) is the interaction of supply and

demand that determines changes in real prices for pulpwood, sawtimber and other forest products. As is true in the case of commodities, there is likely to be an asymmetry at work with respect to the impact of these processes, with prices reacting more quickly to more visible changes in demand, while changes in supply side factors (which only happen with a significant time delay) are more likely to generate surprises. In North America., a good example of this may be the eventual supply side and price impact of the mountain pine beetle epidemic that has been spreading through the northwestern forests of the United States and Canada.

The IMF produces a global timber price index that captures the net impact of demand and supply fluctuations, which is further broken down into hardwood and softwood. The average annual change in real prices (derived by adjusting the IMF series for changes in U.S. inflation) between 1981 and 2007 are shown in the following table:

	Average	**Standard Deviation**
Hardwood	0.4%	11.8%
Softwood	1.7%	21.6%
All Timber	0.1%	9.2%

As you can see, over the long term, prices have been quite stable in real terms, though with a high degree of volatility from year to year (and additional volatility across different regional markets). The final economic process that affects the growth rate of dividends is changes in the REIT's cost structure, and non-timber related revenue streams (e.g., from selling timber land for real estate development). With respect to the latter, the potential imposition of carbon taxes or cap and trade systems for carbon emissions could provide a new source of revenue for timber REITs in the future.

The following table summarizes the assumptions we make about these physical and economic variables in our valuation model:

Growth Driver	Assumption
Biological growth of trees	We assume 6% as the long term average for a diversified timberland portfolio.
Harvesting rate	As a long term average, we assume that 5% of tree volume is harvested each year.
In-growth of trees	We assume this adds 3% per year to the value of timber assets, assuming no change in the real price of pulpwood, sawtimber and other final products.
Change in prices of timber products	We assume that over the long term prices will just keep pace with inflation. However, there are indications that climate change is causing increasing tree deaths in some areas, which should lead to future real price increases (see "Western U.S. Forests Suffer Death by Degrees" by E. Pennisi, *Science*, 23Jan09). Hence our assumption is conservative.
Carbon credits	We assume no additional return from this potential source of value, which also appears to be conservative given forests' role in CO_2 absorption.

This leaves the question of the appropriate return premium to assume for the overall risk of investing in timber as an asset class. Historically, the difference between returns on the NCRIEF timberland index and those on real return bonds has averaged around six percent. However, since the timber REITS are much more liquid than the properties included in the NCRIEF index, we have used four percent as the required return premium for investing in liquid timberland assets. Arguably, this may still be too high, as timber is an asset class whose return generating process (being partially biologically driven) has a low correlation with returns on other asset class. Hence, it should provide strong diversification benefits to a portfolio when they are most needed, and investors should therefore require a relatively low risk premium to hold this asset class.

Given these assumptions, our assessment of the valuation of the timber asset class at **31 March 2009** is as follows:

Average Dividend Yield	6.40%
Plus Long Term Annual Biological Growth	6.00%
Less Percent of Physical Timber Stock Harvested Each Year	(5.00%)
Plus Average Annual Increase in Stock Value due to In-growth	3.00%
Plus Long Term Real Annual Price Change	0.00%
Plus Other Sources of Annual Value Increase (e.g., Carbon Credits)	0.00%
Equals Average Annual Real Return Supplied	**10.75%**
Real Bond Yield	1.77%
Plus Risk Premium for Timber	4.00%
Equals Average Annual Real Return Demanded	**5.77%**
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	**27%**

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 30, 2008, the average daily value of the VIX Index was 19.70, with a standard deviation of 7.88 (skewness 2.28, kurtosis 9.71 – i.e., a very "non-normal" distribution). On **31 March 2009**, the VIX closed at 44.14, To put this in perspective, only 65 days, or 1.4% of our sample had higher closing values of the VIX. However, this high level of implied volatility still seems in line with the equally high degree of uncertainty that currently exists in financial markets and the world economy. Moreover, as noted above with respect to commodities, we note that despite the likely benefits of fiscal stimulus on aggregate demand, and monetary growth on price levels (i.e., minimizing the risk of prolonged deflation), fundamental issues that lie at the heart of the current recession remain unresolved. Critically, we do not believe that this information and its likely impact on

uncertainty levels has been fully incorporated into S&P 500 option prices, and hence into the VIX. For that reason, we estimate that volatility is likely undervalued today.

Sector and Style Rotation Watch

The following table shows a number of classic style and sector rotation strategies that attempt to generate above index returns by correctly forecasting turning points in the economy. This table assumes that active investors are trying to earn high returns by investing today in the styles and sectors that will perform best in the next stage of the economic cycle. The logic behind this is as follows: Theoretically, the fair price of an asset (also known as its fundamental value) is equal to the present value of the future cash flows it is expected to produce, discounted at a rate that reflects their relative riskiness.

Current economic conditions affect the current cash flow an asset produces. Future economic conditions affect future cash flows and discount rates. Because they are more numerous, expected future cash flows have a much bigger impact on the fundamental value of an asset than do current cash flows. Hence, if an investor is attempting to earn a positive return by purchasing today an asset whose value (and price) will increase in the future, he or she needs to accurately forecast the future value of that asset. To do this, he or she needs to forecast future economic conditions, and their impact on future cash flows and the future discount rate. Moreover, an investor also needs to do this before the majority of other investors reach the same conclusion about the asset's fair value, and through their buying and selling cause its price to adjust to that level (and eliminate the potential excess return).

We publish this table to make an important point: there is nothing unique about the various rotation strategies we describe, which are widely known by many investors. Rather, whatever active management returns (also known as "alpha") they are able to generate is directly related to how accurately (and consistently) one can forecast the turning points in the economic cycle. Regularly getting this right is beyond the skills of most investors. In other words, most of us are better off just getting our

asset allocations right, rather than trying to earn extra returns by accurately forecasting the ups and downs of different sub-segments of the U.S. equity and debt markets (for three good papers on rotation strategies, see "Sector Rotation Over Business Cycles" by Stangl, Jacobsen and Visaltanachoti; "Can Exchange Traded Funds Be Used to Exploit Industry Momentum?" by Swinkels and Tjong-A-Tjoe; and "Mutual Fund Industry Selection and Persistence" by Busse and Tong).

That being said, the highest rolling three month returns in the table do provide us with a rough indication of how investors expect the economy and interest rates to perform in the near future. *The highest returns in a given row indicate that a plurality of investors (as measured by the value of the assets they manage) are anticipating the economic and interest rate conditions noted at the top of the next column* (e.g., if long maturity bonds have the highest year to date returns, a plurality of bond investor opinion expects rates to fall in the near future). Comparing returns across strategies provides a rough indication of the extent of agreement (or disagreement) investors about the most likely upcoming changes in the state of the economy. When the rolling returns on different strategies indicate different conclusions about the most likely direction in which the economy is headed, we place the greatest weight on bond market indicators. Why? We start from a basic difference in the psychology of equity and bond investors. The different risk/return profiles for these two investments produce a different balance of optimism and pessimism. For equities, the downside is limited (in the case of bankruptcy) to the original value of the investment, while the upside is unlimited. This tends to produce an optimistic view of the world. For bonds, the upside is limited to the contracted rate of interest and getting your original investment back (assuming the bonds are held to maturity). In contrast, the downside is significantly greater – complete loss of principal. This tends to produce a more pessimistic (some might say realistic) view of the world (although some might argue that the growth of the credit derivatives market has undermined this discipline). As we have written many times, investors seeking to achieve a funding goal over a multi-year time horizon, avoiding big downside losses is arguably more important than reaching for the last few basis points of return. Bond market investors' perspective tends to be

more consistent with this view than equity investors' natural optimism. Hence, when our rolling rotation returns table provides conflicting information, we tend to put the most weight on bond investors' implied expectations for what lies ahead.

Three Month Rolling Nominal Returns on Classic Rotation Strategies in the U.S. Markets

Rolling 3 Month Returns Through	31Mar09			
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style and Size Rotation	Small Growth (DSG) **-8.55%**	Small Value (DSV) **-15.34%**	Large Value (ELV) **-15.08%**	Large Growth (ELG) **-5.79%**
Sector Rotation	Cyclicals (RXI) **-9.58%**	Industrials (EXI) **-18.17%**	Staples (KXI) **-12.47%**	Utilities (JXI) **-18.82%**
Bond Market Rotation	Higher Risk (HYG) **-8.17%**	Short Maturity (SHY) **0.31%**	Low Risk (TIP) **3.54%**	Long Maturity (TLT) **-10.61%**

The following table sums up our conclusions (based on the analysis summarized in this article) as to potential asset class under and overvaluations at the end of **March 2009**. Our starting point is that asset class valuations evolve in response to three forces. The first is fundamental valuation, as reflected in the balance between the expected supply of and demand for returns. The second is investor behavior, which results from a complex mix of cognitive, emotional and social inputs – the latter two comprising Keynes' famous "animal spirits". The third force is the ongoing evolution of political and economic conditions, and the degree of prevailing uncertainty about their future direction. We capture these longer term forces in our economic scenarios. This asset class valuation update contains an extensive discussion of fundamental valuation issues. Our current fundamental valuation

estimates are summarized in the following table. The distinction between possible, likely and probable under or overvaluation reflects an increasing degree of confidence in our estimate. We stress that this is an assessment of valuations at a given point in time, which implies no forecast as to when any over and undervaluations will be reversed. Indeed, before this reversal occurs current over and undervaluations could actually become more extreme. That said, common sense suggests that more extreme situations are more likely to be recognized and reversed.

To aid in that assessment, for each asset class we have also included the most recent three month rolling return (in local currency), as a means of capturing the direction and force of investor behavior. We believe that the likelihood and expected size of a reversal increase when fundamental over or undervaluation becomes more extreme (e.g., moves from possible to likely to probable) and there is evidence of strong returns momentum in the opposite direction (e.g., strong positive returns in the case of an asset class that is probably overvalued). However, conclusions about potential reversals and their likely durability also have to be tested against the likely evolution of future political/economic scenarios and their implications for asset class valuation and investor behavior over a longer time frame (see, for example, our March 2009 Economic Update). This is an important third input into investment decisions, as we do not believe that the full implications of these scenarios are typically reflected in current valuations and investor behavior.

Valuation at 31Mar09	*Fundamental Valuation Estimate*	*Rolling 3 Mos Return in Local Currency*
AUD Real Bonds	Possibly Overvalued	2.57%
AUD Bonds	Possibly Overvalued	-5.13%
AUD Prop.	Probably Undervalued	-22.20%
AUD Equity	Probably Undervalued	-4.08%
CAD Real Bonds	Likely Overvalued	3.01%

Valuation at 31Mar09	Fundamental Valuation Estimate	Rolling 3 Mos Return in Local Currency
CAD Bonds	Likely Overvalued	0.06%
CAD Prop.	Probably Undervalued	-9.96%
CAD Equity	Neutral	-3.69%
CHF Bonds	Probably Overvalued	9.17%
CHF Property	Probably Overvalued	-2.52%
CHF Equity	Neutral	-11.46%
EUR Real Bonds	Likely Overvalued	-3.83%
EUR Bonds	Likely Overvalued	-0.39%
EUR Prop.	Probably Undervalued	-9.57%
EUR Equity	Probably Undervalued	-5.49%
GBP Real Bonds	Likely Overvalued	-1.62%
GBP Bonds	Likely Overvalued	-0.93%
GBP Property	Probably Undervalued	-30.77%
GBP Equity	Probably Undervalued	-14.14%
INR Bonds	Probably Overvalued	-10.16%
INR Equity	Possibly Overvalued	0.63%
JPY Real Bonds	Likely Undervalued	-10.28%
JPY Bonds	Probably Overvalued	-1.76%
JPY Property	Likely Undervalued	-4.36%
JPY Equity	Likely Overvalued	-9.32%
USD Real Bonds	Likely Overvalued	5.25%
USD Bonds	Probably Overvalued	0.34%

Valuation at 31Mar09	*Fundamental Valuation Estimate*	*Rolling 3 Mos Return in Local Currency*
USD Prop.	Probably Undervalued	-32.08%
USD Equity	Neutral	-10.73%
Following in USD:		
Emerging Mkt Equity	Neutral	-0.64%
Commodities Long	Likely Undervalued	-6.08%
Timber	Probably Undervalued	4.35%
Gold	Likely Undervalued	-15.90%
Volatility VIX	Likely Undervalued	10.35%
Currencies (Return in Local for holding USD)	Likely Change in USD vs. Local Based on Difference in 10 Year Gov't Bond Yields	
USD per AUD	Appreciate	0.34%
USD per CAD	Neutral	1.88%
USD per EUR	Neutral	4.49%
USD per JPY	Depreciate	8.21%
USD per GBP	Neutral	0.31%
USD per CHF	Neutral	6.40%
USD per INR	Appreciate	3.97%

April 2009 Economic Update: Analysis of Competing Hypotheses

This past month saw a number of developments with high information value, in the sense that they seem much more likely to occur under either our cooperative or conflict scenario (for a fuller description of these scenarios see our January 2009 issue; for their asset class valuation implications, see our March 2009 issue). These developments fall into four areas: the United States, China, Europe and the recently concluded series of summit meetings between world leaders.

In the United States, the hope that President Obama's election would unify a divided nation to face its greatest economic crisis since the 1930s proved short lived. While the administration's proposed budget passed both houses of Congress, not one Republican voted for it. There is also growing discord within the Democratic Party. Carbon cap and trade legislation appears to be stalled, despite the fact that it is critical to both stimulating cleantech investment and reducing federal budget deficits. In the meantime, cleantech spending has effectively ground to a halt. Elsewhere, the battle lines are being drawn for the biggest battle over healthcare reform since the early days of the Clinton administration. As Jonathan Chait, Senior Editor of the *The New Republic* recently wrote (undoubtedly in frustration, as this is a Democratic leaning magazine), "At a time when the country desperately needs a coherent response to the array of challenges it faces, the congressional arm of the Democratic Party remains mired in fecklessness, parochialism, and privilege. Obama has made mistakes, as did his predecessors. Yet the constant recurrence of legislative squabbling and drift suggests a deeper problem than any characterological or tactical failures by these presidents: a congressional Democratic Party that is congenitally unable to govern."

On the financial front, the latest bank rescue plan was announced this month, and promptly torn apart by many commentators. Private investors in the proposed "public private investment partnerships" will put up only 7.5% of the funds needed to buy so-called "legacy" assets from the banks (i.e., assets whose current uncertain value is a legacy of the banks' previously shoddy risk management practices). As a result, these private investors will have significant upside return potential with very limited downside risk (since the Department of the Treasury will put up the other 7.5% of the equity in these PPIPs while the Federal Deposit Insurance Corporation will provide 85% loan financing). Of course, those upside returns depend on a PPIP's ability to buy dodgy (er, legacy) loans and securities at a sufficient discount from their likely final recovery value. That presents two challenges. The first is accurately estimating what that value is likely to be, which is extremely difficult given the many uncertainties we face today. The second is persuading the banks to sell these assets at what are likely to be prices well below their current carrying value (which would wipe

out more bank capital, and require some combination of further shrinkage of their balance sheets and more capital infusions from the U.S. Government). The decision this month to relax mark-to-market accounting rules will only make it easier for banks to decide not to sell these legacy loans, and instead keep them on their books while hoping they can make enough money over time from their good assets to absorb the inevitable future write-downs. In light of this combination of circumstances, many commentators have voiced the opinion that the PPIPs are unlikely to meet with much success in buying legacy assets.

Unfortunately, this continuation of "business as usual" at the banks will likely prove damaging on a number of interconnected fronts. Because bankers will continue to be unsure of the true value of the loans now on their books, they will be reluctant to extend new credit to any but the strongest borrowers. Along with continuing questions about the banks' solvency, extremely tight credit will reinforce the general climate of uncertainty, and accelerate the decline in private sector demand, which in turn will further worsen loan quality. Indeed, this is already happening. Defaults on credit card, business, and commercial real estate loans are all rising, and recoveries on loans going into default are trending below the 40% assumed in many credit default swap valuations. In light of these developments, the IMF has just raised – yet again – its estimate of the total amount of bad debts in the world financial system to US $ 4 trillion. Assuming just a 25% ultimate loss on this amount gives a sense of the enormous scale of the financial system crisis we continue to face. It seems likely that these worsening conditions will only exacerbate growing anger at, and resistance to, the eventual cost of "bailing out the bankers." The furor about the AIG bonuses may be just a taste of what lies ahead. As Wolfgang Munchau recently wrote in the *Financial Times*, "the politics of bank rescue are toxic...from a political perspective there is nothing in it for a rational politician. Handing over hundreds of billions to the banks is akin to political suicide, no matter how you do this...The real problem with the US bank rescue plan is that it may exhaust the public's sense of fair play." For an example of the direction in which the public mood seems headed, read "The Quiet Coup" by Simon Johnson in the May 2009 issue of *The Atlantic*. Judging from the

number of people who have forwarded this to me, it seems to be striking a very responsive chord among people not normally known for their anger at the financial industry.

Finally, as John Hussman recently noted, ("On the Urgency of Restructuring Bank and Mortgage Debt, and of Abandoning Toxic Asset Purchases") the sale of CDO and mortgage backed securities tranches to PPIPs will make it even more difficult to restructure consumer mortgages, which are, at an increasing pace (due to the combination of job losses, interest rate resets, and falling home values) crushing household sector confidence and spending. As we have previously proposed, Hussman calls for converting a portion of these mortgages into "property appreciation rights" which would be administered by the U.S. Treasury (through the tax system) and could be pooled into index securities that track residential property as an asset class. However, he notes that unless the PPIPs purchase the full amount of an outstanding MBS, it will remain impossible to execute this type of mortgage debt/equity swap (indeed, at least one lawsuit has already been filed by the holder of a CDO security to block the restructuring of the underlying mortgages).

These concerns are becoming recognized more widely and seem to be engendering growing support for more radical steps, such as the forced conversion of bank bond debt into equity, the termination of many more bank executives (after Rick Wagoner was forced out at General Motors, this step seems inevitable), or splitting the most troubled institutions into so-called good and bad banks. For example, this could be accomplished by the FDIC seizing a bank, selling its good assets and deposits to a buyer and leaving its bond and equity holders with a "bad bank" that held the "legacy" assets. As Elias Karakitsos pointed out in a recent Levy Institute policy note ("An Assessment of the Credit Crisis Solutions"), the government could also step in and protect certain bondholders (e.g., pension funds or life insurance companies) against excessive bad bank losses that might pose a systemic threat. Regardless of the path that is eventually taken, the key point is that the U.S. banking crisis (to say nothing of the one in Eastern Europe) is far from resolved, and the longer this is delayed, the

worse the economic situation will become, and the more explosive the eventual political repercussions.

Taken together, the continuing problems with the Obama administration's stimulus plan, its environmental, energy, and healthcare reforms, and its initiatives to rescue major financial institutions seem much more consistent with the development of our Conflict Scenario than they do with the emergence of our Cooperative Scenario.

As Judge Richard Posner recently wrote, "we will discover soon enough whether the measures taken by the Obama administration are reviving the animal spirits of producers and consumers. The intentions are good. But the lack of focus, the partisan squabbling, the dizzying policy oscillations, the delays in execution, and the harassment of bankers are bad. By increasing the uncertainty of the business environment, these things are dampening animal spirits – the courage to reason and act in the face of an uncertain future."

Let us move on to the evolving situation in China, where over the last month a powerful new narrative appears to be gaining significant traction: China as the victim of a global economic collapse caused by irresponsible America. The underlying argument was put forth most clearly in a little noticed speech given by Zhou Xiaochuan, Governor of the People's Bank of China (the central bank). Zhou first asserts that "tradition, culture, family structure, demographic structure, and stage of economic development are the major reasons for the high savings ratio in East Asia... [These countries] are influenced by Confucianism, which values thrift, self-discipline, zhong yong or Middle Ground (low key) and anti-extravagancy... [Also] the family tie is strong in the East Asian countries, and families shoulder social responsibilities such as providing for the elderly and bringing up children... [Similarly], Japan's savings ratio is much higher than that in the U.S. This can be largely ascribed to cultural, family value and demographic features in Japan, which are fairly similar to those in other East Asian countries." Zhou also asserts that "some argue that an inadequate social security system leads to high savings ratio. Though logically sound, this argument lacks adequate empirical support." After reviewing the history of the 1997 crisis, Zhou claims that "the high savings ratio and large foreign reserves in the East Asian

countries are a result of defensive reactions against predatory speculation." Just to be sure his point is clear to Western critics demanding a rise in China's exchange rate, Zhou stresses, "the fact is that the level of savings is influenced by a wide range of factors, and it can't be adjusted simply by changing the nominal exchange rate." He then asserts that "euphoria sentiment in the market" caused U.S. savings to decline, that "intensified regulation of international speculative capital flows" is needed, that "appropriate measures should be taken to channel more savings into developing countries and emerging markets", since "these economies are the future growth engines of the world economy" and that "reform of the international monetary system should be advanced to reduce the role of the U.S. dollar."

A more direct Chinese criticism of the United States appeared a week later, in the form of an oped in the *Financial Times* by Yu Qiao, a professor of economics at Tshinghua University. He writes, "Most of Mr. Obama's stimulus spending is devoted to social programmes rather than growth promotion which may exacerbate America's over-consumption problem and delay sustainable recovery. On top of this, the unprecedented fiscal stimulus, with the Federal Reserve's move to inject money into credit markets, contains self-destructive seeds...America may seek to resolve its economic mess by devaluing the dollar at best and a default at worst...Analysts have warned of the dangers of the U.S. Treasury bond bubble that developed in late 2008...If this bubble bursts, East Asians would be victims...If the dollar collapsed, the consequences would devastate Asians' hard-earned wealth and terminate economic globalisation." Qiao then proposes a program that would enable foreign holders of U.S. government bonds to convert them into "equity claims on sound corporations and infrastructure projects" whose principal value would be guaranteed by the U.S. government, since "Asians do not want to bear the risk of this investment because of market turbulence and a lack of knowledge of cultural, legal and regulatory issues in U.S. businesses." This increasingly aggressive stance towards the United States is also mirrored in a book published on March 12th that has quickly become a best seller and source of widespread debate in China. Aimed at the nation's youth, Unhappy China, is an extended criticism of the west, and argument in favor of the superiority of

China.   For example, its five authors write that "if China stood as the world's top country, it would not act like the United States, which has been irresponsible, lazy and greedy and engaged in robbery and cheating. They have brought economic recession to the whole world."

In sum, it appears that Chinese leaders have concluded that, for whatever combination of reasons, they cannot quickly facilitate a reduction in export demand by increasing domestic consumption spending.   Hence, they face a twofold challenge: maintaining export volumes and limiting domestic unrest caused by rising unemployment.   Recognizing that it cannot safely continue to accumulate U.S. financial assets, China is now taking other steps to maintain export demand, including its proposals for a new international reserve currency (in which it can accumulate foreign exchange reserves) and the extension of Yuan denominated swap lines to developing countries to finance their purchase of Chinese goods (thus far this year, new swap lines have been put in place with Argentina, Belarus, Indonesia, Malaysia and South Korea).   In a world of rising unemployment, this insistence on maintaining exports is sure to meet with resistance, and seems likely to eventually trigger a protectionist response.   At the same time, the Chinese leadership appears to be encouraging rising nationalism at home as a means of avoiding social unrest triggered by economic dislocation. Unfortunately, history teaches that once this genie has been let loose, it is hard for political leaders to control, and has often led to international conflict.

Moreover, China is not alone in blaming others for the world's economic and financial problems.   A recent article in Germany's popular *Der Spiegel* magazine had this to say about the background to the current global economic crisis: "The US had allowed itself to sink into an abject lifestyle.   It sold more and more billions in new government bonds in order to preserve the appearance of a prosperous nation.   To make matters worse, private households copied the example of the state.   The average American now lives from hand to mouth and has 15 credit cards.   The savings rate is almost zero. At the end of the Bush era, 75 percent of global savings were flowing to the US...The change in government in Washington has not brought a return

to self-restraint and solidity. On the contrary, it has led to further abandon...The only things which are currently running at full production in the US are the printing presses at Treasury." And in an interview with the *Financial Times*, German Chancellor Angela Merkel took the same position as the Chinese: "The German economy is very reliant on exports, and this is not something you can change in two years." Indeed, "it is not something we even want to change." At the same time, we are seeing a growing split within the Eurozone, with Germany refusing to bear the cost of supporting much more troubled economies like Spain, Portugal, Ireland, Greece and Austria, as well as non-Eurozone countries in Eastern Europe and the Baltics. Meanwhile, as is true of most human beings under stress, the French have predictably reverted to deeply ingrained behaviors, with rising labor unrest, corporatism, and criticism of the Anglo-Saxon world. Finally, in a small but ominous move, the Swiss have begun actively intervening to reduce the value of their currency (which has risen in value due to heavy buying by investors seeking a safe haven) in order to maintain their current account surplus. We have no doubt this development was greeted with satisfaction in Beijing.

It is against this larger backdrop that we can evaluate the results of the recent series of summit meetings, including the G20 and NATO. They did not provide much encouragement with respect to the development of our cooperative scenario. China, Germany and other countries with substantial unused government debt capacity refused to agree to the U.S. demand for greater fiscal stimulus to maintain global demand. The U.S. refused France and Germany's demand for much more aggressive regulation of financial institutions. And at the NATO conference, the latter responded by refusing the U.S. request for the deployment of more European troops to Afghanistan. Of course, all these fundamental disagreements were diplomatically papered over in the summit communiques, which instead focused on its major success – agreement to significantly increase the IMF's resources, in order to provide more international support for struggling developing country and Eastern European economies.

In sum, despite recent media commentary about "green shoots" being spotted in the economy, and signs of a possible uptick in consumer confidence, we conclude

that the events of the past month provide much more evidence against the development of our cooperative scenario (which implies an earlier and stronger economic recovery) than evidence against the conflict scenario (which includes a prolonged trough in demand, much higher inflation, and sharp reduction in global integration).

So what does this mean for investors and their asset allocations? We use the following table to provide insight into the balance of market views as to which of three regimes – high uncertainty, high inflation, or normal growth – is developing. Under each regime, certain asset classes should deliver relatively higher returns. We assume that the rolling three month return on these asset classes is a useful indicator of the market's collective estimate of the regime that is most likely to develop in the short-term.

Regime Indicators		31Mar09
High Uncertainty	**High Inflation**	**Normal**
Short Maturity US Govt Bonds (SHY) **0.31%**	US Real Return Bonds (TIP) **3.54%**	US Equity (VTI) **-10.91%**
1 - 3 Year International Treasury Bonds (ISHG) **0.02%**	Long Commodities (DJP) **-6.08%**	EAFE Equity (EFA) **-16.21%**
Equity Volatility (VIX) **10.35%**	Global Commercial Property (RWO) **-25.41%**	Emerging Equity (EEM) **-0.64%**
Gold (GLD) **4.35%**	Long Maturity Nominal Treasury Bonds (TLT)* **-10.61%**	High Yield Bonds (HYG) **-8.17%**

* falling returns on TLT indicate rising inflation expectations

As you can see, the weight of investor opinion still seems to favor the continuation or worsening of the current high uncertainty regime, while placing less emphasis on assets that will perform well under the higher inflation regime that we believe will inevitably result from today's large fiscal deficits and high money supply growth.

Last but not least, starting with this issue, we will be summarizing the accumulated evidence over the past three months (on a rolling basis) against both of our scenarios in the following table. In our analysis, we use a technique known as "Analysis of Competing Hypotheses" which, like the scientific method, focuses on disproving rather than confirming evidence, in order to offset the impact of the well known confirmation bias. In addition, it stresses the search for evidence with a high diagnostic value – that is, evidence that is much more likely under one scenario than under others. We hope that this new structured approach to presenting our cumulative analysis will make it easier for our readers to incorporate our views into their own forecasting process.

	Cooperative Scenario	Conflict Scenario
Brief Scenario Description:	More rapid domestic consumption growth in China and cleantech investment demand in North America return the world to a health rate of growth, and enable preservation of the world trading system, a reduction in global imbalances, and monetary actions to head off an extended period of high inflation.	Domestic politics prevents an increase in cleantech investment in the United States, while China continues to pursue export led growth while encouraging rising nationalism to limit domestic unrest and the political threat to the current Chinese leadership. This only reinforces growing demands for protection in Europe and the United States. Weak global demand is maintained by rising fiscal deficits, which are increasingly monetized, leading to much higher inflation.

	Cooperative Scenario	**Conflict Scenario**
Key Agent Level Assumptions:		
U.S. Middle Class	Resolution of banking crisis, passage of health care reforms, mortgage relief, and a sharp increase in cleantech driven investment spending lead to reduced uncertainty and a shift towards higher savings and lower consumption, without triggering populist demands for protectionism.	Continued economic stagnation, uncertainty, and insecurity lead to more extreme partisanship and the development of strong populist calls for protectionism and income redistribution.
Chinese Peasants	Land reform and economic growth (which provides jobs) boost incomes while a sharp increase in government spending on health care and education limits resentment of Communist Party corruption and economic inequality compared to coastal elites. This minimizes social unrest and threats to continued legitimacy of the Party's governance of China.	Growing unemployment and a sense that government stimulus is disproportionately benefiting coastal and party elites triggers widespread unrest and peasant alignment with disaffected students, urban unemployed, and members of the military. The Chinese government becomes aggressively nationalist in an attempt to channel this anger outward. At best, this triggers a global retreat into trading blocs; at worst, this strategy fails and China descends into fragmented authoritarian regions with minimal central control.
Iranian Youth	Prolonged economic stagnation and rising inflation lead to the defeat of President Ahmadinejad in June 2009 elections, and widespread pressure for better relations with the West. Economic self-	Supreme Leader Khamenei ensures that Ahmadinejad is re-elected. Repression and emigration are used to limit resistance by younger Iranians to these policies. The country attempts to improve economic

	Cooperative Scenario	**Conflict Scenario**
	interest trumps the Revolutionary Guards' ideological opposition to this opening. Moderation of Iran's conflicts with the west and a renewal of inward investment flows lead to increased hydrocarbon production, limiting upward pressure on global energy prices.	conditions via closer ties with China, while maintaining its nuclear program (which could trigger an attack by Israel) and a conflict-oriented policy versus the US that continues to put upward pressure on energy prices.
Key Issue Level Assumptions:		
Overleveraged Consumers	Effective mortgage relief plans implemented in most affected countries, while stronger economic growth maintains income needed for debt repayment.	No effective mortgage relief legislation passed. Instead, rise in bankruptcies and mortgage foreclosures puts continuing downward pressure on housing prices.
Financial System Weakness	Combination of stronger investment and export led economic growth and effective bank rescue plans reduces uncertainty about health of system, and enables sufficient flow of credit to support renewed economic growth.	Worsening economic conditions and failure of bank rescue plans (due to design or political resistance) cause uncertainty to remain high, credit flows to be constrained, and defaults to increase, which all contribute to a worsening process of debt deflation.
International Imbalances	Rising domestic consumption spending in China enables a reduction in export dependence, while U.S. imports are reduced by a shift from private consumption to private saving and higher investment spending and greater exports. This reduces global current account imbalances to a	China's continued emphasis on export led growth, at a time when the US is incurring high fiscal deficits (and eventually higher taxes) to maintain global demand, triggers demands for greater protection, which in turn precipitate a dollar exchange rate crisis as other countries move to limit the losses on their

	Cooperative Scenario	Conflict Scenario
	manageable level.	foreign exchange reserves. Result is a fragmentation of the global trade and financial system into much less integrated blocs.
Evidence Over the Previous Three Months <u>Against</u> Each Scenario (most recent month first)	***Evidence Against the Cooperative Scenario***	***Evidence Against the Conflict Scenario***
April 2009	- In the US, proposed environmental, energy and healthcare reform legislation all look to be in trouble. - Much criticism of the Geithner bank rescue plan in the US, and the sense it will not resolve the growing asset quality crisis. - Growing populist anger at bankers and the cost of bank bailouts in US and UK - At best only very weak movement towards residential mortgage relief in the US - Growing emphasis on "China as the victim" narrative, from official and unofficial sources. - Apparent Chinese emphasis on maintaining exports, though with attempt to create an alternative to the USD in which to accumulate FX reserves. - Growing stress within	- G20 agreed significant increase in IMF resources (though admittedly this includes funds that were already in the pipeline). This will enable better support for developing countries and Eastern Europe, to limit fall in demand and banking crises fallout in those regions. - Evidence that fall in consumer spending is stabilizing, and that inventory rebuilding is starting, after record setting reductions (thanks to extremely efficient global supply chains). - Evidence that fall in consumer confidence has bottomed out. - Mohammand Khatami, the most moderate of the candidates in the Iranian presidential race, has dropped out, ostensibly to avoid splitting the opposition vote with the somewhat more

	Cooperative Scenario	Conflict Scenario
	Eurozone and European Union, as Germany's interests diverge from what most stressed nations see as being in their best interest. France reverting to type with growing labor unrest, corporatism, and attacks on Anglo Saxons. Also evidence of growing European estrangement from the US, with dawning realization that underlying problems are related to national policies and interests, and not presidential personalities. • Lack of agreement at G20 on appropriate level of fiscal stimulus and best way to re-regulate financial sector. Failure of NATO to agree more European troops for Afghanistan mission. Growing risk that US middle class will grow increasingly resentful of what it may come to see as raising its taxes to carry more than its fair share of the world's economic and security burdens.	conservative Hussein Moussavi. This apparently raises the probability of an Ahmadinejad defeat in June.
March 2009	• Whether due to inexperience or lack of staff, there are apparently serious delays in getting the Obama stimulus funds flowing – for example, cleantech	• Obama's proposed energy and environmental programs, along with healthcare and education reforms, should stimulate investment spending, and

	Cooperative Scenario	Conflict Scenario
	investment has ground to a halt. There is also evidence of delay in reaching agreement on the details of Secretary Geithner's bank bailout plan. • Growing questions about the ability of the US Government to bear the cost of bailing out the financial system, in addition to the large deficits implied by the Obama stimulus program and budget, not to mention the off-balance sheet liabilities for future Social Security and Medicare spending (assuming no changes in these programs). These concerns are reflected in rising spreads on credit default swaps written on US government debt. • Obama administration continues to support Card Check legislation. Some studies show that Roosvelt's support for Wagner Act (which, like Card Check also made it easier to unionize private sector businesses) increased uncertainty and limited business investment and employment growth. • Public sector unions around the world appear to be digging in their	also produce higher tax revenue (via auction of cap and trade plan's emissions allowances). • Level of technology spending in Obama package is, in constant dollar terms, approximately equal to spending incurred to put a man on the moon. If the Obama program produces similar productivity and other spinoff benefits, the impact on long term growth could be very significant. • Chinese have made some adjustments to their stimulus plan in the direction of greater social safety net spending. • Federal Reserve is aggressively increasing the money supply, and attempting to directly boost credit availability, and has announced a long-term 2% inflation target. All of these measures will minimize the risk of a prolonged deflationary spiral developing.

	Cooperative Scenario	Conflict Scenario
	heels and demanding higher taxes to fund their wages and benefits. This is raising domestic conflict in many countries. • A growing amount of evidence is consistent with the hypothesis that China may be intentionally fomenting conflict with the west as part of a long term strategy to return the Middle Kingdom to its proper place in the world. • The cancellation of many projects on the supply side of the global energy industry seems to guarantee an eventual spike in prices when global demand begins to recover. As was the case in the summer of 2008, such a spike would function as a tax that could quickly choke off the beginnings of a sustained global recovery.	
February 2009	• In his confirmation hearings, US Treasury Secretary Geithner claims China has been manipulating its exchange rate. Premier Wen Jiabao responds in kind at the World Economic Forum, blaming the global	• Evidence that US is reaching out and attempting to reduce tensions with Iran. • China announces regulations making layoffs more difficult, and increasing spending to strengthen social safety net.

	Cooperative Scenario	Conflict Scenario
	economic crisis on "an unsustainable model of development, characterized by prolonged low savings and high consumption." Asked by the FT whether China bore any responsibility for the crisis, Wen replied "I think such a view is ridiculous." • Fourth Quarter 2008 data show rapidly worsening domestic situation in China, with rising unemployment and falling property prices. • NYT reports evidence that capital outflows from China are increasing.	• Mohammad Khatami, a popular moderate, enters Iranian presidential race with the support of many student groups. He is thought to have a good chance of unseating Ahmadinejad, assuming a relatively clean election.

Product and Strategy Notes

A Closer Look at Asset Class Returns in 2006-2008

Because adaptive markets are constantly evolving, the ability to explain what happened in the past does not guarantee an equal ability to accurately forecast the future. Yet without an understanding of the past, the future is bound to be even more surprising when it arrives. With this in mind, we have taken a closer look at the dynamics of real asset class returns over the past three years, and reached some conclusions about their implications for our future approach to asset allocation.

Our starting point is the following table, which shows the correlation of real monthly USD returns between a number of asset classes between January 2006 and December 2008.

	Domestic Property	Foreign Property	Domestic Equity	Foreign Equity	Emerging Equity	Volatility (VIX)
Dom Prop	1.0					
For Prop	.77	1.0				
Dom Eq	.83	.88	1.0			
For Eq	.74	.88	.89	1.0		
Emg Eq	.65	.80	.89	.94	1.0	
Volatility	(.50)	(.58)	(.61)	(.67)	(.61)	1.0

As you can see, the positive correlations between these asset classes were extremely strong, as was their average negative correlation with volatility. This is what people mean when they say that "correlations went to one during the crisis", and in so doing reduced the expected downside risk protection from holding a diversified portfolio. On the other hand, not all asset classes had such strong correlations with volatility over this period. The correlation between short term U.S. Treasuries and Volatility was positive, at .17. Correlations were essentially neutral with Swiss Francs, gold, and timber (note, however, that in this analysis we use the NCREIF Timber Index, instead of Plum Creek Timber, because the latter, in its REIT form, does not go back to 1990. However, the NCREIF series is appraisal based, and we have interpolated its values from quarterly to monthly, both of which distort its comparative meaning – e.g., by artificially reducing its standard deviation and correlation). Correlations with volatility were also reasonably low, though still opposite signed (i.e., their returns went down somewhat when volatility went up) for real return bonds (.34), domestic bonds (.25), foreign currency bonds (.24) and commodities (.25), as measured by a long position in a fund tracking the DJAIG Index.

We also checked to see if monthly returns for different asset classes were truly independent, as is usually assumed in asset allocation analyses. Our approach was to measure correlations of different asset class returns on their own one and two months prior returns. Using data covering the full 1990 to 2008 period, we found that

while most returns were close to zero (as theory would lead you to expect) some clearly exhibited what is known as "autocorrelation." For example, one month autocorrelations (and again, remember that this only captures linear relationships) were .47 for inflation, .52 for real returns on short term Treasuries, .24 for foreign commercial property, .23 for the Swiss Franc, .18 for foreign currency bonds, .17 for domestic bonds and .16 for commodities. Using a two month lag, we found that short Treasuries still exhibited a significant autocorrelation, at .21, while real return bonds had a negative autocorrelation of (.26). This has an important implication. The usual practice in asset allocation analyses is to scale up monthly returns data to annual returns by raising them to the twelfth power. The underlying assumption is that the data are independent; however, the non-zero autocorrelations show that this isn't the case. Hence, using the "power of time" approach introduces an estimation error into the data. The way to get around this is to calculate average annualized returns not by adjusting monthly returns, but rather directly, on a rolling basis (e.g., January to January, February to February, etc.).

We next did a principal component analysis of the rolling annual returns realized from January 2006 to December 2008. PCA is a statistical technique that reduces the variation in a given set of variables to variation in a smaller number of independent underlying factors. For example, assume you have four variables in a data set. Variables one and two may have a very strong positive correlation with factor A (technically, principal component A), while variables three and four have a strong negative correlation with factor B. The art in this type of analysis lies in making inferences about just what those statistical factors represent in the real world. The first factor we extracted from this data set explained 49% of its variation (i.e., 49% in the variation of returns). It had very strong positive correlations with domestic property (.69), foreign property (.87), domestic equity (.84), foreign equity (.92) and emerging equity (.85). It also had moderately strong positive correlations with all other asset classes but two. Its positive correlation with short term Treasuries was only .12, and it had a very strong negative .86 correlation with volatility, as measured by the VIX

Index. It doesn't take much art to interpret the real world meaning of this factor: it was the enormous uncertainty shock that hit the world's financial markets in 2008.

The second factor explains 18% of the variation in our returns data. It had strong negative correlations with real return bonds (.49), domestic bonds (.63), short term Treasuries (.86), and timber (.62, but again we caution about the uncertainty inherent in the NCREIF data series). It had moderately positive correlations with all equities and domestic property, and close to zero correlation with commodities and gold. After looking at a variety of economic data, this factor seems most consistent with changes in real bond yields. For example, looking back to the increase in real yields that occurred in 2006, we found that commentators generally believed this would be good for equities, as it would prevent the economy from becoming too overheated.

The third factor explains 12% of the variation in returns. It is highly correlated with returns on commodities, and to a lesser extent gold, timber, emerging market equities, real return and foreign currency bonds. It has a moderately negative correlation with domestic bonds, short term Treasuries and domestic equities and property. We interpret this factor as the commodities cycle, which peaked in July 2008, and brought with it rising fears of higher inflation, the sustainability of the U.S. current account deficit, and the future of the U.S. dollar exchange rate. Overall, these three factors – the uncertainty shock, changes in real interest rates, and the commodities cycle, account for 79% of the variation in real returns on our asset class series between 2006 and 2008. Intuitively, these explanations resonate with our memory of that period.

Our next step was to perform the same analysis on rolling 12 months returns data from 1991 to 2005 to see if these same factors were present. We admit to feeling somewhat akin to the 9-11 Commissions, going back to see what dots were present in the past that we had failed to properly connect. Sure enough, we found the same factors present in the data. The real interest rate cycle explained 19% of the observed returns, though the correlations were somewhat different (e.g., more strongly positive for domestic and emerging market equities, and more negative for volatility). The

commodities cycle again explained 12% of return variation, with quite similar asset class correlations. However, uncertainty shocks had a much smaller impact in the earlier period, explaining 27% of variation, compared to 49% in 2006 – 2008. Moreover, in the earlier period, the correlation of volatility with this factor was about half as strong as in the later period, and the correlation with property and equity markets was also lower, though not by as much. Also, in the earlier period, commodities, gold, timber, and real return bonds had low correlations with the factor, while in the later period these were largely replaced by short term Treasuries, and to a lesser extent, timber. In sum, in the 1991 – 2005 data we see some indications of the impact of uncertainty shocks on asset class returns, but not to the degree that we saw in 2006 – 2008. The fact that the top three factors explain 79% of variation in the later period, but only 58% in the earlier period reinforces this point – there were clearly more factors with a relatively stronger affect on returns in the earlier period than there were over the past three years, which were dominated by the uncertainty shock.

In broad terms, however, the results of both PCA analyses are consistent with a view that asset class returns can be segmented into three different regimes. One is characterized by the normal business cycle, exemplified by rising and falling real interest rates. We would expect the supply and demand for returns on different asset classes to be relatively well balanced during this regime, which is most consistent with idealized markets that are in equilibrium and characterized by efficient pricing. The other two regimes represent departures from this equilibrium, in which we would expect to see less efficient pricing and wider gaps between the expected supply of and demand for returns on different asset classes. The dominant characteristic of the first disequilibrium regime is elevated uncertainty. The dominant characteristic of the second is elevated inflation. To test these ideas, we divided monthly real returns from 1990 to 2008 into three groups. Fifty high volatility months had changes (either positive or negative) in volatility of 20% or more. Fifty four high inflation months had a change in the CPI of .4% or more (i.e., almost 5% per year). The remaining months were deemed to be in the normal regime. The following table shows the average

monthly return and standard deviation for each asset class under each regime, as well as within regime rankings of relative returns and risks.

	Normal				*High Volatility*				*High Inflation*			
	Avg	Rank	*Std Dev*	*Rank*	Avg	Rank	*Std Dev*	*Rank*	Avg	Rank	*Std Dev*	*Rank*
Real Return Bonds	0.30%	10	*1.10%*	*2*	0.22%	5	*2.06%*	*4*	0.13%	7	*1.39%*	*4*
Domestic Bonds	0.51%	7	*1.17%*	*3*	0.30%	4	*1.70%*	*3*	(0.13%)	10	*1.06%*	*3*
Foreign Bonds	0.45%	8	*2.48%*	*5*	0.62%	2	*2.86%*	*5*	0.21%	6	*2.23%*	*5*
Domestic Property	1.09%	3	*4.04%*	*11*	(0.66%)	8	*7.24%*	*11*	0.39%	3	*4.49%*	*9*
Foreign Property	0.99%	6	*3.55%*	*8*	(1.60%)	10	*5.78%*	*8*	(0.04%)	9	*3.59%*	*7*
Commodities	0.36%	9	*3.63%*	*9*	(0.46%)	7	*5.72%*	*7*	0.97%	2	*5.59%*	*11*
Timber	1.05%	4	*1.47%*	*4*	(0.76%)	9	*1.20%*	*2*	0.08%	8	*0.55%*	*1*
Domestic Equity	1.42%	2	*3.47%*	*7*	(1.86%)	11	*6.19%*	*9*	(0.31%)	11	*3.40%*	*6*
Foreign Equity	1.04%	5	*3.87%*	*10*	(2.10%)	12	*6.47%*	*10*	(0.50%)	13	*5.14%*	*10*
Emerging Equity	1.51%	1	*5.51%*	*12*	(2.36%)	13	*9.24%*	*12*	0.23%	5	*7.14%*	*12*
Short Treasuries	0.00%	12	*0.59%*	*1*	0.01%	6	*0.70%*	*1*	(0.49%)	12	*0.57%*	*2*
Gold	0.13%	11	*3.45%*	*6*	0.39%	3	*3.96%*	*6*	0.34%	4	*4.20%*	*8*
Volatility	(2.22%)	13	*9.61%*	*13*	14.51%	1	*31.35%*	*13*	2.09%	1	*15.88%*	*13*
Average	**0.51%**		**3.38%**		**0.48%**		**6.50%**		**0.23%**		**4.25%**	
-- ex volatility	**0.74%**		**2.86%**		**-0.69%**		**4.43%**		**0.07%**		**3.28%**	

This table illustrates a number of interesting points. First, the difference between the regimes is clear. Second, there are obvious benefits to hedging against the downside risks represented by the high uncertainty and high inflation regimes. Third, an allocation to volatility represents a potentially powerful way to limit tail risks, though at the cost of lower returns during the normal regime. In the past, we have noted that investable volatility products are based not on the VIX index, but rather on futures contracts on the VIX, which usually have much lower price fluctuations, which reduce their potential value as a hedging investment. However, this analysis has refined our views on these products. Even if you assume that the returns on VIX futures (which are now available to retail investors via Barclays VXX exchange traded note) equal

only 33% of the returns on the underlying index, the above table suggests they may still be a good hedging investment in some portfolios. While further analysis will be needed to determine when that will be the case, we are encouraged by what appears to be a real opportunity for reducing the potential return impact of tail risk in portfolios.

Fourth, gold (which is now more easily accessed via ETFs) also has attractive hedging benefits. However, as an asset class (as opposed to a liquid store of value, in the case of gold coins), gold apparently provides fewer hedging benefits than volatility. Again, more analysis will be needed to determine if this applies to all portfolios, or whether gold as a financial asset class distinct from commodities may in some cases have a permanent role. Fifth, and consistent with many other studies, the table also shows that relative risk rankings are much more consistent across regimes than relative return rankings. Finally, while we have not shown them, our analysis of the correlations between asset class returns under the three regimes found what many readers would expect: correlations are lowest under the normal regime, highest when volatility is high, and in the middle under the inflation regime.

As we noted at the outset, because adaptive markets are constantly evolving, the ability to explain what happened in the past does not guarantee an equal ability to accurately forecast the future. Yet an understanding of the past can surely help us to better prepare for the future, even if we cannot accurately forecast the exact form it will take. In our case, we have for sometime been working on a new portfolio construction methodology that will be based, in part, on an expanded regime switching methodology that incorporates the lessons we have just reviewed. Where we used good and bad regimes in the past, we will be moving to a three regime model, with more significant differences in the risk, return and correlation assumptions under each regime. In addition, because estimation errors are inescapable in any asset allocation analysis, we will also continue to employ shrinkage methodologies to limit their potential impact. We believe that these changes will further improve a portfolio construction methodology that has already proved its mettle under some very challenging circumstances. That said, we also reiterate two key points: all asset allocation methodologies contain inescapable shortcomings. For that reason, they

must always be complemented with ongoing asset class valuation analyses (based on a mix of approaches, like our fundamental and scenario based methodologies), as well as a willingness to occasionally move beyond relatively passive risk management techniques like diversification and automatic rebalancing, and employ more active hedging measures like moving to cash or buying options.

Bank Stress Tests

We recently read a fascinating speech by Andrew Haldane, Executive Director for Financial Stability at the Bank of England, and, judging from his writing, a smart and witty man. In "Why Banks Failed the Stress Test", he presents a very good overview of three causes of the risk management errors that led to the 2008 crisis: disaster myopia (e.g., believing the Golden Age of Moderation would go on forever), network externalities (e.g., not taking system level issues – like rapidly falling liquidity – into account in a bank's risk model), and misaligned incentives (e.g., determining this year's bonus on the basis of trades and deals whose true profit wouldn't be known for years). Yet for us, the most interesting passage in the speech was the following: "A few years ago, ahead of the present crisis, the Bank of England and the Financial Services Authority commenced a series of seminars with financial firms, exploring their stress testing practices. The first meeting of that group sticks in my mind. We had asked firms to tell us the sorts of stress which they routinely used for their stress tests. A quick survey suggested these were very modest stresses. We asked why. Perhaps disaster myopia – disappointing, but perhaps unsurprising? Or network externalities – we understood how difficult these were to capture? No. There was a much simpler explanation according to one of those present. There was absolutely no incentive for individuals or teams to run severe stress tests and show these to management. First, because if there was such a severe shock, they would very likely lose their bonus and possibly their jobs. Second, because in that event the authorities would have to step in anyway to save a bank and others suffering a similar plight. All of the other assembled bankers began subjecting their shoes to intense scrutiny. The unspoken words had been spoken. The officials in the room were aghast. Did banks not

understand that the official sector would not underwrite banks mismanaging their risks? Yet history now tells us that the unnamed banker was spot-on...When the big one came, his bonus went, and the government duly rode to the rescue...Stress testing was...regulatory camouflage." It is with this comment in mind that we look forward to the release, at the end of April, of the results in the U.S. of the stress testing results mandated by the U.S. Treasury. When you read them, remember this: their "more adverse" scenario assumes only a 3.3% decline of GDP in 2009, followed by a 0.5% gain in 2010, with unemployment reaching a maximum of 8.9% this year and 10.3% in 2010. If these relatively optimistic assumptions produce dire conclusions about the solvency of one or more reporting banks, it will be an interesting indicator, to say the least.

More Comparative 2008 Performance Data

We've been keeping an eye on the slow announcements of 2008 performance data from some well known asset managers, and comparing them to our model portfolios' results (and doing this conservatively, assuming no rebalancing and no increase in liquidity as we recommended in May 2007). Ontario Teachers Pension Plan is perhaps Canada's best known institutional investor. In 2008, they were down (18%) in nominal terms, compared to (6.6%), in nominal terms, for our 4% target real return portfolio, and (9.1%) for our 5% target real return portfolio. In the United States, Bridgewater Associates is one of the world's best known hedge fund managers. Its "All Weather" strategy portfolio is composed of passive positions (some of which are leveraged) in a broad range of asset classes. In 2008, it was down (20%), compared to (15.9%) for our 4% target real return portfolio, and (20.9%) for our 5% target real return portfolio. Finally, the California Public Employees Retirement System (CALPERS, which is the U.S. equivalent of OTPP), was down (27.1%) in 2008.

More Bad News for Active Funds

We have also been keeping up with the growing number of articles that take a critical look at the performance of actively managed funds in 2008 (e.g., "2008: The Worst Year Ever for Active Management?" by Arnott and West on indexuniverse.com, or "Managed Funds Offer Little Cover From the Bear" by Damato and Gullapalli in the *Wall Street Journal*). As the latter note, "fans of active stockpickers have argued that those managers should do better than index funds in a bear market, because they can move to cash or more defensive shares. But that may be mostly wishful thinking." In part this is due to the higher expenses charged by these funds, and the higher tax liabilities generated by their frequent trading. In part it is due to the difficulty of accurately forecasting outcomes produced by a complex adaptive system. And in part it is due to the fact that many active funds have mandates to stay fully invested in a given asset class (which, as John Redmond of Pan-Asset has noted, simply implies that someone further up the chain was responsible for not adjusting a portfolio's asset allocation in order to avoid severe losses in 2008). Whatever the true mix of causes, the end result is causing changes in behavior. More funds are flowing out of long-only active products that combine beta (asset class) and alpha (security selection) exposures, and into a mix of pure beta (broad passive index) and uncorrelated alpha products. And this is not just happening at the retail level. Another series of articles has noted the major active/passive rethink that is underway at insurance firms selling variable annuities products (see, for example, "Adjusting Annuities: Insurance Companies Moving to Passive Strategies for Better Hedging" by Douglas Appell in Pensions and Investments, and "Laggards Get the Boot" by Scism and Maxey in the *Wall Street Journal*). The underlying cause of the problems facing these firms is that they have offered minimum guaranteed annuity payouts, while offering annuity buyers a large number of actively managed investment fund options. When these active managers underperform their passive benchmarks, any hedging strategies used by the annuity provider (to manage the risk associated with the cost of making good on the minimum guarantees) become less effective, causing costs to rise and profits to

decline. As Scism and Maxey note, "industrywide, issuers of performance guarantees took charges against earnings totaling $1 to $2 billion in the fourth quarter of 2008 because of the weak performance of actively managed funds." As a result, they are quickly shifting to a mix of variable annuity investment options that include a higher percentage of passive funds and a lower percentage of active ones. Finally, Pablo Fernandez (along with Vicente Bermejo) has just published a detailed study of mutual fund performance in Spain between 1991 and 2008 ("Rentabilidad De Los Fondos de Inversion"). Fernandez is an outstanding thinker, and we try not to miss anything he writes (unfortunately, this paper is only available in Spanish). The authors find that over the period analyzed, only 18 of the 1,025 funds (1.76%) with ten years of performance data outperformed the relevant index benchmark.

New Products

Imitation, as they say, is the sincerest form of flattery. With that in mind, we note the launch of a number of new products. Claymore will soon launch an ETF that, like a recent exchange traded note from Elements (ticker LSC), tracks the performance of the Standard and Poor's Commodity Trends Indicator, which takes long and short positions in a basket of commodities. The strongest selling point will be the ETF versus ETN structure, as the latter requires that a buyer take credit risk exposure to the issuer (in the case of LSC, this is HSBC bank), while the former does not. That makes it likely that we will switch to this product in our model portfolios once it becomes available. Elsewhere, we see that Lyxor will launch a new ETN that tracks the price of gold via derivatives, with the remaining principle invested in sovereign bonds to limit the underlying credit risk. Full credit to the structuring team, but we think the marketers have their work cut out for them trying to convince investors that this offering is superior to ETFs that are backed by, and redeemable in, actual physical gold. Finally, we note that Deutsche Bank's x-trackers have launched an ETF that tracks a broad hedge fund index (a similar product to one IndexIQ has in the works in the U.S.). We reiterate our problem with these products: the mix of strategies they

track includes not only those that pursue uncorrelated alpha (which is very attractive), but also expensive (think 2 and 20 to the underlying hedge fund managers) long-only strategies. A far more attractive approach would be to launch an ETF that tracked an index that only included uncorrelated alpha strategies.

Interesting Research Papers

Four recent studies are likely to be of interest to financial advisers and individual investors. The first is "Debt Literacy, Financial Experience and Overindebtedness" by Lusardi and Tufano. They find that "debt literacy is low, especially among women, the elderly, minorities, and those with low incomes and wealth....Individuals with lower levels of debt literacy tend to transact in high cost manners, pay 46% more in credit card fees, and are more likely to report their debt loads are excessive or that they are unable to judge their debt position." It is clear that the cost of poor debt literacy are likely to be extremely high on a national or indeed a global basis. In "Socially Responsible Investing in the Global Market", Cortez, Silva, and Areal examine the performance of SRI funds in Europe and the US between 1996 and 2008. They conclude that "socially responsible funds in most European markets do not show significant performance differences in relation to conventional and socially responsible benchmarks, while US funds show evidence of underperformance." They also find distinctive tilts towards small cap and value companies by SRI funds, as well as a significant tendency towards investing in home country SRI companies (i.e., "home bias"). In "Sex Matters: Gender Differences in the Mutual Fund Industry", Ruenzi and Niessen find that female mutual fund managers are "more risk averse, follow less extreme and more consistent investment styles and trade less than male managers. Although their average performance does not differ, male managers achieve more extreme performance outcomes and show less performance persistence. Nevertheless, female managers receive significantly lower inflows, particularly from institutional investors." We could not help but consider these findings in light of those from another study: "The Good, the Bad, or the Expensive: Which Mutual Fund

Managers Join Hedge Funds?" by Deuskar, Pollet, Wang and Zheng. They conclude that "a mutual fund manager with superior past performance is more likely to start managing an in-house hedge fund while continuing to manage mutual funds. However, a mutual fund manager with poor past performance is more likely to leave the mutual fund industry to manage a hedge fund...In addition, the managers of mutual funds with greater expenses are more likely to enter the hedge fund industry. The magnitude of such expenses is negatively related to subsequent performance in the hedge fund industry. Hence, hedge funds do not acquire superior performance for their investors by hiring these expensive managers." The next time a salesperson pitches you on hedge funds, ask them what they think of this study.

Model Portfolios Update

Our model portfolios are constructed using a simulation optimization methodology. They assume that an investor understands the long-term compound real rate of return he or she needs to earn on his or her portfolio to achieve his or her long-term financial goals. We use SO to develop multi-period asset allocation solutions that are "robust". They are intended to maximize the probability of achieving an investor's compound annual return target under a wide range of possible future asset class return scenarios. More information about the SO methodology is available on our website. Using this approach, we produce model portfolios for six different compound annual real return targets: 7%, 6%, 5%, 4%, 3%, and 2% We produce two sets of these portfolios: one assumes only investments in broad asset class index funds. These are our "all beta" portfolios. The second set of model portfolios includes uncorrelated alpha strategy funds as a possible investment. These assume that an investor is primarily investing in index funds, but is willing to allocate up to ten percent of his or her portfolio to equity market neutral investments.

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 2009, our USD cash

benchmark is 0.37% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include uncorrelated alpha). This portfolio assumes that an investor believes it is not possible to forecast the risk or return of any asset class. While we disagree with that assumption, it is an intellectually honest benchmark for our model portfolios' results.

The year-to-date nominal returns for all these model portfolios can be found at: http://www.indexinvestor.com/Members/YTDReturns/USA.php